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COMPUTERWORLD

Compaq stalks host servers

BY MICHAEL FITZGERALD
and CAROL HILDEBRAND
CW STAFF

HOUSTON — After three years of slow going for the SystemPro in its struggle against minicomputers, Compaq Computer Corp. vowed last week to give its server family the features, software diagnostic tools and support it needs to truly do battle with systems as powerful as mainframes.

Early reactions leaned toward cautious enthusiasm. Analysts in particular warned that Compaq's large systems targets will not roll over and play dead. Local-area network managers appear more open to the concept.

However, Gary Stimac, Compaq senior vice president and general manager of its Systems Division, said Compaq sees roadblocks in its ability to sell network servers without certain mainframe-like functions. "We need to duplicate the functionality that's on a mainframe — fault tolerance, management controls, all those things," he said.

The first piece of the software, called Compaq Insight Manager, is scheduled to be announced June 8, with more announcements expected later in the year. Insight Manager will include diagnostic tools, compo-

Continued on page 8

Performing beyond its size

Compaq claims its PC server enhancements will for the first time enable the company to challenge mini- and mainframe-level servers

INSIGHT SERVER MANAGEMENT

Software:

- **Server manager facility** - Board and software that handles remote alerts and allows remote management. *Available now.*
- **Server manager collector** - Software tool that allows for easy reports on system's status. *June availability.*
- **Memory system tracking** - Alerts users to possible memory problems before they happen. *Third-quarter availability.*
- **Critical error log** - *Third-quarter availability.*

Hardware:

- **Advanced error-correcting code memory** - Allows full chip failure correction. *Third-quarter availability.*
- **Full server mirroring** - Allows fault tolerance through a fiber-optic connector. *Third-quarter availability.*

DECstation users fear abandonment

Unix flip-flop to push migration to Alpha

BY MARYFRAN JOHNSON
CW STAFF

A number of Digital Equipment Corp. customers reacted with anger or disappointment last week to the fog settling over the future of DEC's Unix-based workstation and server line.

DEC officials have acknowledged that its strategic "Unix for the '90s" operating system — the Open Software Foundation's OSF/1 — will not run on its current Unix-based DECstation/DECsystem line. Instead, OSF/1 is slated only for the next-generation Alpha reduced instruction set computing systems, due out late this year and into 1993.

"I think this sends a very bad signal that DECstations are a dead platform," said Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y. "I'm sitting here now with nothing that makes sense to buy until I see Alpha. That says to me that they don't want my money."

Make way for Ultrix

The DECstation line is based on RISC processors from Mips Computer Systems, Inc. and runs DEC's Ultrix, a Unix variant. With OSF/1 now crossed off the list for the DECstations, DEC has restarted its stalled development work on Ultrix.

"In our zeal to get OSF/1 in production, we defocused on Ultrix, and that was a bad idea," said David Stone, vice president of DEC's software products group. He added that DEC spends roughly $75 million annually on OSF/1 work, while Ultrix gets about one-fourth that amount because it is "reasonably stable."

Tim Yeaton, a manager at DEC's Unix software group, said last week that customers can count on three more releases of Ultrix as it becomes a "high-quality, stable, solid platform

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RBOCs cast low-cost wide-area net

Nationwide deployment schedule laid out for frame-relay, SMDS services

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — The seven regional Bell operating companies and two independent carriers outlined their short-term nationwide fast-packet deployment plans last week to enthusiastic reviews.

The fairly aggressive announcements of national frame-relay services and Switched Multimegabit Data Service will give users — many of whom are overwhelmed by the myriad of available fast-packet technologies for bandwidth-intensive applications — more ammunition to fire up their wide-area networking strategies.

In concurrent announcements in Atlanta and at the Interop '92 Spring show here, the carriers committed to offering frame-relay service in 21 major cities by year's end, with 25 more cities to be added by next year. SMDS offerings are slated to emerge in 16 cities by the end of this year, expanding to another 28 during 1993.

"If you would have told me a year ago that we'd see the Bell companies announce service and pricing for both technologies now, I would have thought you were crazy," said Steve Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

The local carriers had initially focused on SMDS, then jumped on the frame-relay bandwagon when the technology piqued user interest last year.

The two technologies address similar applications. Frame relay is generally preferred where higher volumes of traffic travel among fewer users, while SMDS is more tuned to communications among a wide array of far-flung users, analysts said.

Continued on page 20

The $40,000 bolt from out of the blue

BY ELISABETH HORWITT
CW STAFF

They say lightning doesn't strike twice, but don't tell that to Bill Lauzon.

His firm, Kevin L. Erwin Consulting Ecologists, Inc., lost about $40,000 worth of personal computer and network equipment when lightning struck nearby twice within two weeks last July.

The Fort Myers, Fla., firm had installed surge protectors to protect its power lines against the frequent lightning storms in the area, but both strikes bypassed the power lines and went over the coaxial cable that connects the company's local-area network across two buildings.

The consulting firm lost all 11 network cards on its LANs both times. "If we had had 100 cards, we'd have lost 100," Lauzon said. The first strike also totaled three workstations and one plotter and cost the firm two days' downtime, he added. "And these were not even direct lightning hits — they just struck in the area."

Moreover, after it was hit, the company began experiencing "corrupted data files here and there occasionally," Lauzon said. It took six months to resolve this problem.

In general, computer users are a lot more vulnerable to electrical disturbances than they might think. Best Power Technologies, Inc., a supplier of power protection products, claims that the average user site annually experiences 443 power "events" that are potentially dangerous to electronic equipment or data.

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INSIDE

Executive Report — It's 'sync' or swim time for IS. Fleet/Norstar's Michael Zucchini makes staying on board with business goals look simple. Page 75.

It's a start. Users applaud the decision by 20 developers to back software licensing API. Page 4.

Du Pont Information Systems' restructuring results in deep cuts; more downsizing expected to come. Page 14.

NEWSPAPER

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Quotable

"The [CIO] name is so stupid. . . . Nobody can be the chief information officer because there's too much information."

ALEX J. POLLOCK
FEDERAL HOME LOAN BANK
OF CHICAGO

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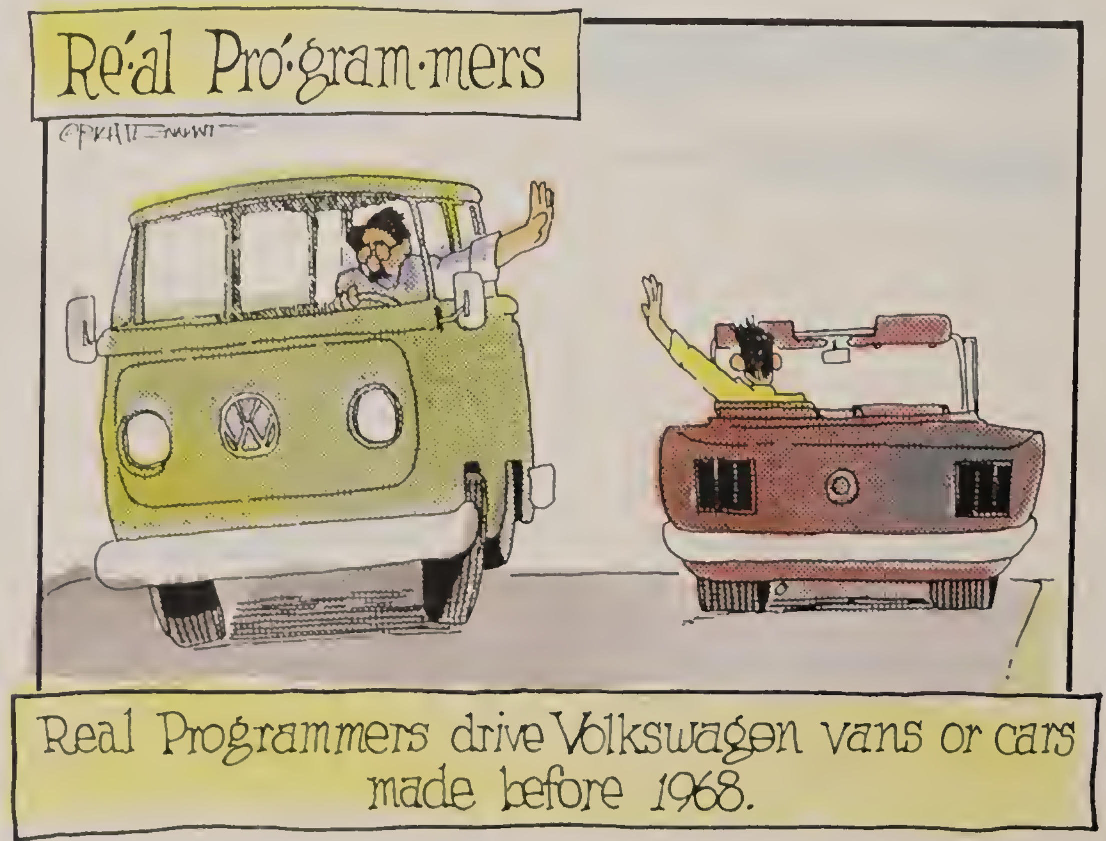
The 5th Wave



Real Programmers drive Volkswagen vans or cars made before 1968.

EXECUTIVE BRIEFING

■ **Heads up, mainframes! Compaq is gunning for data center-quality performance** from its SystemPro line in a June 8 release of mainframe-type diagnostics tools and systems management software. Compaq vows to deliver the kind of features that are crucial to data center management in the first of several hardware and software server announcements coming this year. **Page 1.**

■ **Du Pont Information Systems continues to rout redundancy in search of better value** for the customer and a $205 million annual savings for the company. In the process, it has folded 150 DEC VAX centers into 75, is eyeing IBM centers for possible consolidation and plans to cut 275 more jobs by the fall; 225 jobs have already been axed. **Page 14.**

■ **The shifting sands under DEC's Unix plans** have some users worried and others watchful, particularly those shops heavily invested in the apparently doomed DECstation/DECsystem line of Ultrix-based systems. **Page 1.**

■ **The local telephone companies roll out their nationwide fast-packet plans** through 1993 at Interop '92 Spring and stun users with inexpensive sample frame-relay pricing. **Page 1.**

■ **Hewlett-Packard introduces its RISC-based Corporate Business Systems,** aimed at displacing IBM mainframes in corporate data centers. **Page 12.**

■ **Imagine packing an 1,800-character shipping manifest into a square symbol less than 2 in. on each side,** or scanning aisle after aisle of inventory with a wave of the hand. With two-dimensional bar codes, small portable scanners and sophisticated conveyor belt monitors, businesses will soon be able to do just that. **Page 81.**

■ **Despite high interest by CIOs and CEOs** and the importance to companies and careers, many IS groups still do a poor job of aligning themselves with business goals. **Page 75.**

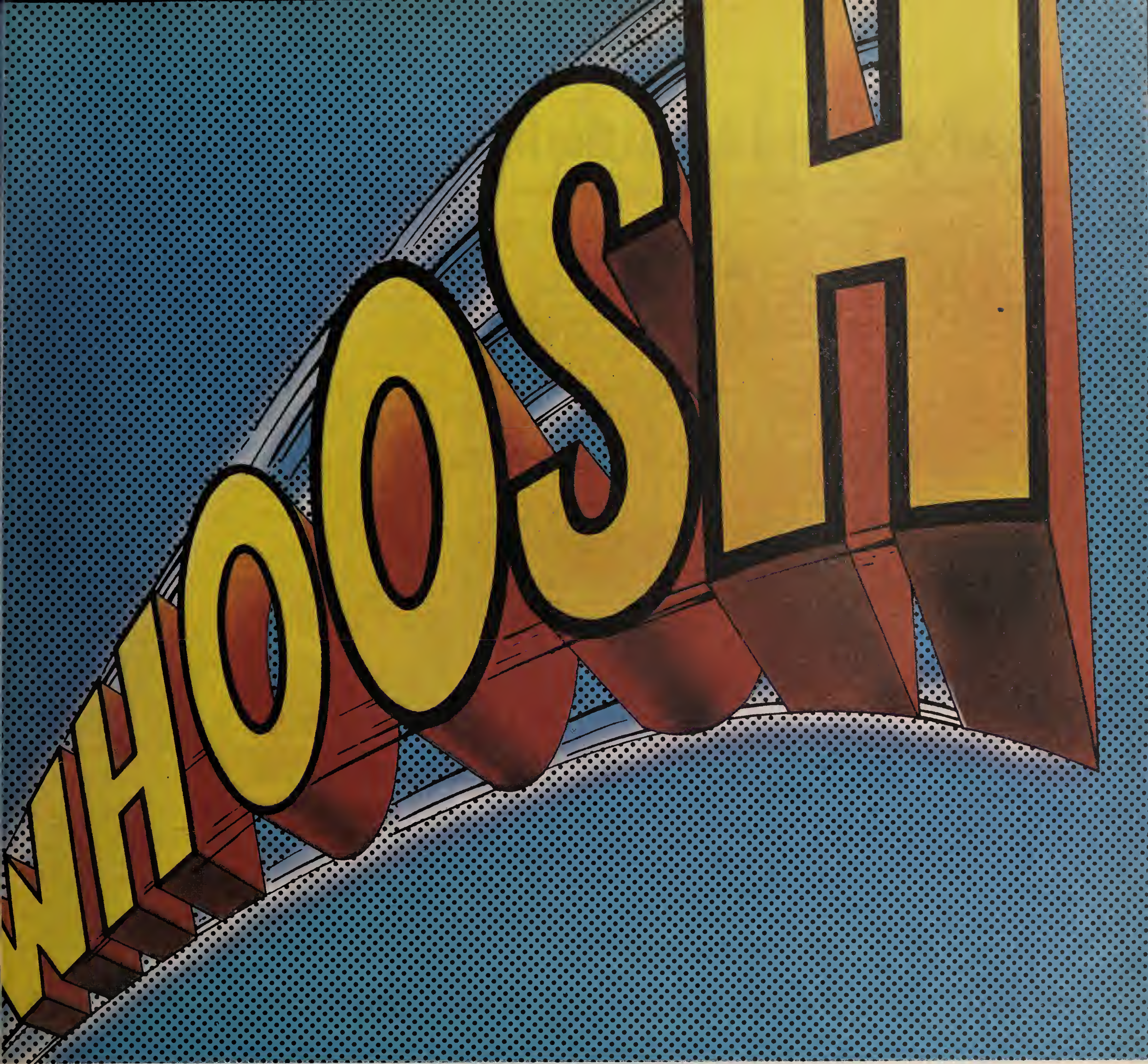
■ **Sun Microsystems rolls out four models in its new SPARCstation 10 line,** which includes built-in ISDN networking capabilities and a surprisingly strong performance showing. **Page 12.**

■ **Lotus currently dominates the LAN-based E-mail market with CC:Mail,** but Microsoft is hot on its heels with Microsoft Mail 3.0 and a strategy that targets the millions of host E-mail users who may soon be migrating to LANs. **Page 4.**

■ **Data centers are finding that not only is money green, but 'green' makes money.** Managers report they can both save money and rake in the bucks by recycling materials such as laser cartridges and printer paper. **Page 65.**

■ **A month down the road, the new pricing structure for Computer Associates' mainframe software** is drawing mixed reviews from users, although more than half of those questioned give positive marks. **Page 65.**

■ **On site this week:** Conrail, as part of its effort to reengineer its business into a one-stop-shop transportation company, is immersed in an overhaul of its network and software infrastructures. **Page 6.** When the Foreign Agricultural Service decided to move to its own computer systems, it faced a tough challenge: how to run systems throughout the world without the help of on-site technical help. **Page 43.** A high-speed backbone switch is helping Harte-Hanks Data Technologies eliminate tape backup operations, interconnect multiple computing platforms and speed data delivery times. **Page 59.** Depository Trust, Wall Street's largest securities clearinghouse, is adding a backup data center to provide quicker recovery in the event of a disaster. **Page 67.** Pen computers could help Detroit Edison trim $1.6 million from its labor costs in a year by making tree trimmers more efficient. **Page 35.**



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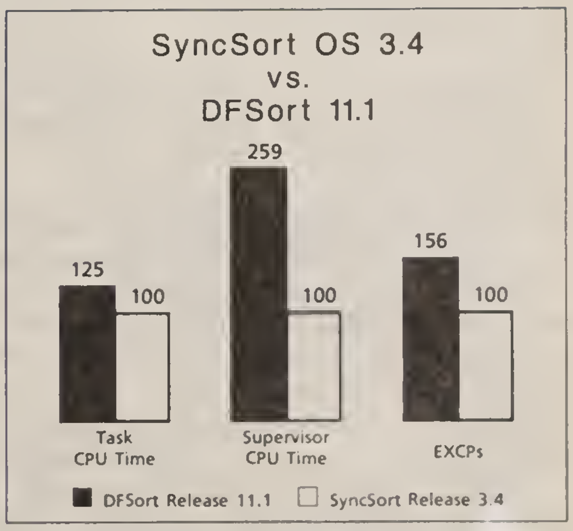

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E-mail standard not in the bag

Microsoft, Lotus duke it out, introduce improved integration features

BY ROSEMARY HAMILTON
and CHRISTOPHER LINDQUIST
CW STAFF

Microsoft Corp. is gunning for the top slot in the local-area network mail market, but current leader Lotus Development Corp. is just as determined not to give it up.

Both are now making appeals to corporate users by playing up integration capabilities that will ship with their mail packages. The goal is to provide better links to current host-based electronic-mail systems, a key issue with users contacted recently.

"Whichever one provides us with solid integration with [IBM's] OfficeVision VM and can provide us with really terrific companywide scheduling, they would be in a really good position," said Rachel Stamieszkin, an information systems manager at Unum Corp., an insurance company in Portland, Maine.

As Microsoft readied its June debut of Mail 3.0 last week, it said it would target corporate customers by highlighting such functions as the product's ability to attach the front-end client portion of Version 3.0 to a variety of host systems, including IBM's widely used Professional Office System (Profs).

Not to be outdone, Lotus last week confirmed that it is working on technology to provide a direct link to and from its CC:Mail calendaring and scheduling functions and the IBM Profs scheduling component.

Fight for the lead

These corporate appeals are part of an ongoing battle for the lead slot in the LAN E-mail market, which is critical to both companies. LAN E-mail is increasingly key to users' enterprise-wide mail strategies and is also a central component to emerging workgroup plans.

Lotus has been the market leader since it acquired CC:Mail last year. Last week, it introduced an upgrade for CC:Mail for DOS, and a Unix version is slated to ship this summer. It now claims to have 2 million E-mail users worldwide.

Microsoft, meanwhile, is moving in at a fast clip. According to its own numbers, it has about 1.4 million users. In January, the "Electronic Mail and Micro Systems Newsletter" estimated that Lotus had a total of 1.6 million mail users, while Microsoft had 750,000.

The latest focus on integration will likely strike a chord with many users who are struggling with either multiple mail systems or efforts to migrate more users from host platforms.

"For us to move from the Profs platform, we need calendaring [on a LAN], not just E-mail," said Robert Hecht, vice president of investment systems at Prudential Investment Corp. "The problem is, there's no [LAN] product now that has the ability to do that calendaring interconnection with Profs. Until there is, very few of our users would be able to migrate."

For some users who have selected Microsoft or Lotus as their LAN mail provider, the integration plans have been a factor.

Banc One Services Corp. in Columbus, Ohio, recently evaluated Microsoft Mail and Lotus' CC:Mail. "Technically, we really felt there wasn't a hill of beans of a difference," said Terry Lowder, vice president of advanced technology. Instead, Banc One decided to look at the mail architectures both companies are promoting. Microsoft is pushing its own Messaging Application Programming Interface, and a group of four companies, including Lotus, is touting the Vendor Independent Messaging (VIM) initiative. Banc One plans to adopt VIM as its corporate mail architecture, in part because of Lotus' close relationship to IBM.

With VIM, Banc One is aiming for a higher level of integration because it will eventually be able to provide such common services as directory definitions that all VIM-compliant mail systems will support, Lowder said.

Leading the pack

On the LAN mail specification front, it appears that Microsoft, with its own initiative, is slightly ahead of a rival vendor group that includes Lotus and supports the VIM effort. Microsoft said beta-test copies of a subset of the full Messaging Application Programming Interface (MAPI) specification and a development kit will be made available to developers and corporate users next month. An announcement on VIM specifications is expected soon.

If common APIs, such as MAPI or VIM, were adopted throughout the industry, application developers and mail-service providers could create products that would be easily connected by users to create customized mail solutions.

Microsoft announced MAPI earlier this year as a specification intended to give programmers a common interface for accessing mail-enabling features such as mail transports and address books. The Microsoft initiative also provides for back-end, or mail engine, specifications.

Mighty mail

Users can expect a slew of new features in both Microsoft's and Lotus' E-mail packages over the next year

Microsoft Mail 3.0

- **Client** – Spell checking, message binders, Object Linking and Embedding, name finder, transport independence. June.
- **Server** – Increased directory space size (limited only by hardware). Fault-tolerant directory synchronization. June.
- **Gateways** – Encapsulation allows rich data types to be transported across mail systems with no information loss. June.
- Two workgroup applications based on technologies from the following areas: calendaring, scheduling, forms routing, group memory, work flow and document management. By year's end.

Lotus CC:Mail

- Enhanced gateway to link CC:Mail and Notes. Features directory synchronization, better import and export facilities. June.
- Tighter integration with Notes, allowing a user in Notes to select the Notes mail or CC:Mail. Scheduled for year's end.
- CC:Mail for Sun Microsystems, Inc.'s OpenLook will ship 'within three months.'
- Next release of CC:Mail for Windows to ship before year's end.
- Also slated for early 1993 is evolution of CC:Mail calendaring and scheduling functions to work with the calendaring function of IBM Profs.

CW Chart: Tom Monahan

Vendors standardize on software license interface

BY JIM NASH
CW STAFF

REDWOOD CITY, Calif. — Users seeking relief from multiple, conflicting software licensing policies got a break last week when 20 key developers announced they would standardize on one approach to software licensing.

The decision by developers — including Microsoft Corp., Apple Computer, Inc., Novell, Inc., Digital Equipment Corp. and Lotus Development Corp. — to adopt the Software Publishers Association's (SPA) License Service application programming interface (API) will make it easier for users to ensure compliance with licensing agreements.

The specification standardizes one aspect of software licensing: the API used by applications to access licensing services.

This specification provides a consistent way for developers to incorporate licensing parameters into their packages.

Currently, information systems managers must deal with a confusing tangle of licensing schemes. Their frustration is compounded by the fact that not all software packages will work with all licensing servers.

Licensing servers dole out copies of software according to the number of licenses a company has purchased for each package.

Round of applause

However, the API will allow any conforming application to be managed by any server that also complies with the interface.

As a result, systems managers were quick to applaud the announcement, partially out of hope that automating the process of distributing authorized copies of software will reduce the number of accidental licensing infractions.

The strong industrywide support also got a cheer from Microcomputer Managers Association, Inc., which released a white paper last fall with seven network software licensing recommendations of its own.

Joanne Witt, president of the Warren, N.J.-based association and a white paper co-author, endorsed the API with one caveat. She said that while the interface is a good first step toward untangling license chaos, vendors must still address the question of how to account for licenses that employees on stand-alone, portable and home computers use.

Of the two dozen vendors that have also endorsed the API, Novell, DEC, Microsoft and Gradient Technologies, Inc. were on hand to say that they will incorporate it into future versions of their software.

No specific dates were announced, but the consensus was that the API could be used for commercial applications by year's end.

Separately, the Open User Recommended Systems (OURS) group — formed last year largely by Novell customers and other software vendors — has also examined the issue of software licencing.

OURS member Donald Sternfeld, director of IS at Philadelphia law firm Morgan, Lewis & Bockius, said it is "wonderful" to hear that so many vendors are supporting a standard interface.

"We've got to make sure whoever makes software gets their legitimate compensation," Sternfeld said. "But we've got to make sure it doesn't get onerous for the user, either."

The API would seem to somewhat ease the task of managing software distribution, he said.

Longing for help

"If this can take the pain out of [managing software licenses] and make my job easier, I'd love it," said Fred Winograd, director of distributed computing planning at Merrill Lynch & Co. in New York.

His sentiments were echoed by others frustrated by the lack of coordination among software vendors on this issue.

"This is excellent. It's good to hear that the vendors are moving on something end users have been talking about at trade shows and user-group meetings for the past 36 months," said Joel Diamond, technical director at the Windows User Group Network in Media, Pa.

Ken Wasch, executive director of Washington, D.C.-based SPA, said the next step in sorting out licensing policies is up to consumers.

Wasch predicted that users will increasingly use coherent licensing policies as a criterion for buying software. New policies will follow successful ones in fairly quick order, he said.

He pointed to Microsoft's decision last year to allow a single license to be used when someone who works with an application copies it for home use, as long as usage can be broken down to 80% in the office and 20% at home.

Other vendors are quickly following suit, Wasch said.

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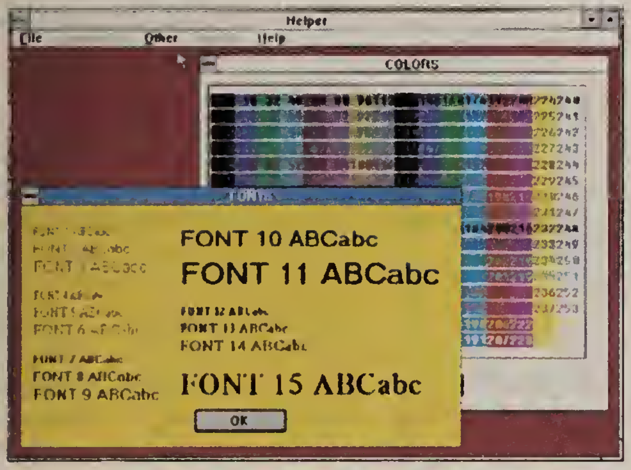

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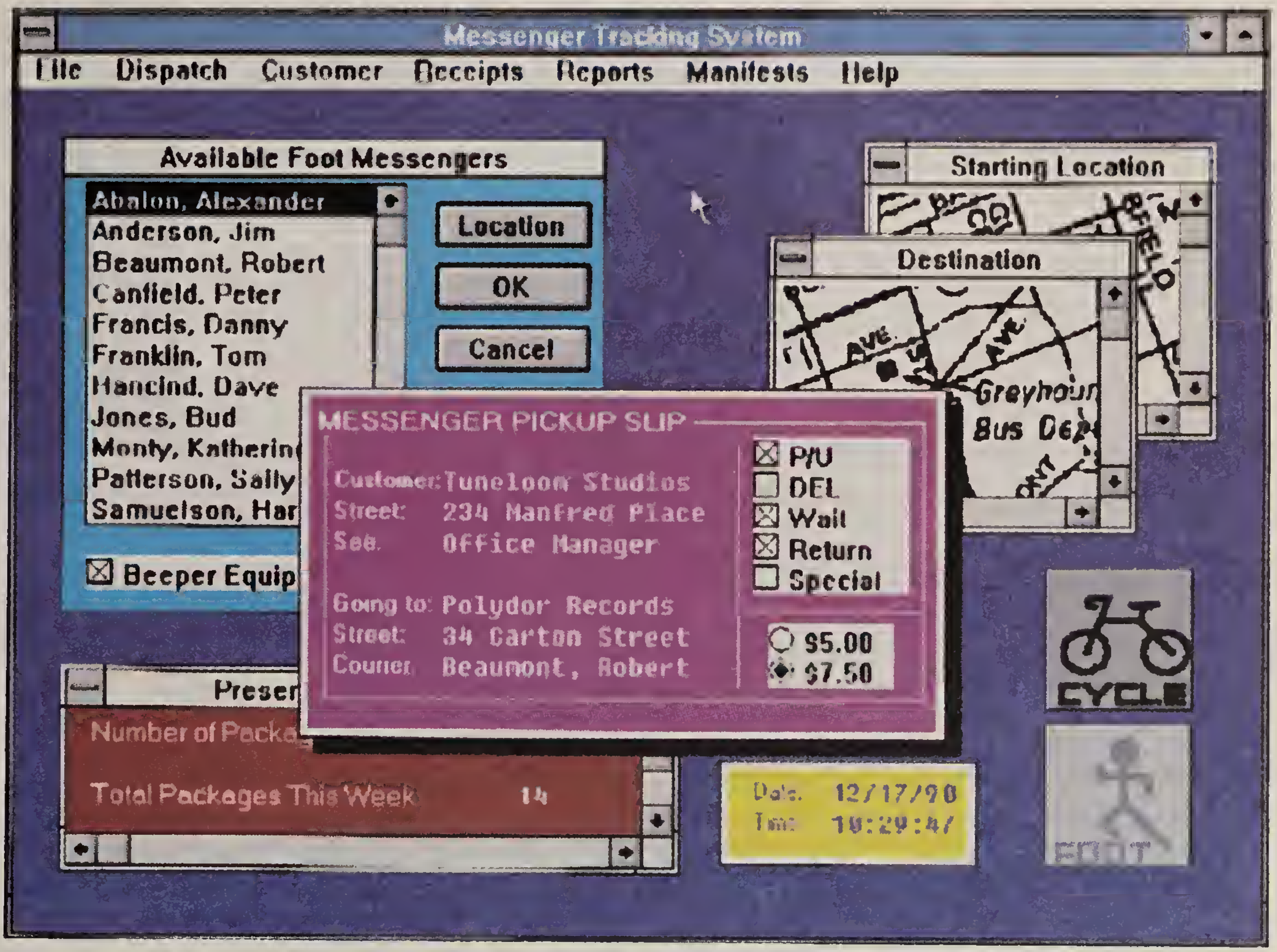

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NEWS SHORTS

NetView 2.3 due in December

IBM last week announced a December delivery date for NetView Version 2.3. Network managers have been waiting since the product's introduction last fall for the system's real-time management capabilities and multivendor graphical user interface. Among the NetView 2.3 enhancements that were not included in last fall's announcement are the ability to manage Ethernet 802.3 and frame-relay devices, the ability to support a virtually unlimited number of consoles, a customizable command interface for 3270-based NetView workstations and faster searching through automation tables that tell an application the right response to a given network situation.

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Dial boosts Andersen contract

Phoenix-based Dial Corp.'s Consumer Products Group last week tapped its mainframe outsourcing provider, Andersen Consulting, to take over applications management and upgrades for Dial's VAX 4000-based distributed systems. Andersen has been providing Dial with host processing from Andersen's Dallas processing center since 1990 under a five-year, $10 million contract.

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Ingres reveals OpenView link

Ingres Corp. told 800 users gathered in Tarpon Springs, Fla., that its Ingres relational database technology would be embedded in Hewlett-Packard Co.'s OpenView 3.0 network management system. The move came nearly two years after HP took an equity position in The Ask Cos., allowing Ask to acquire Ingres in October 1990.

. . . .

Vaccine foils stealth virus

The Davidsohn Group, a publisher of securities industry software, last week announced the release of Vaccine 5.0, an antiviral software package that detects and guards against the slippery "stealth bomber" virus. The stealth virus is a particularly troublesome strain that conceals itself through such techniques as self-encryption, redirection of disk reads and alteration of disk directory data. Vaccine 5.0 sells for $129.

. . . .

IBM network adopts X.25

The IBM Information Network last week announced that it will expand its support of X.25 and IBM Advanced Peer-to-Peer Networking (APPN) links on its value-added network. Formerly, an X.25-compliant user device could use IBM's network to communicate with Systems Network Architecture devices but not with other X.25 devices. IBM is now supporting X.25-to-X.25 communications, both here and abroad, and is extending its overseas X.25 and APPN services to link users in different countries.

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Short takes

Microsoft Corp. said it has exceeded expectations by shipping 3 million copies of Windows 3.1 during the first six weeks of its release. The company also announced plans to work with banking software vendors and systems integrators to produce a common set of application programming interfaces for the banking industry. . . . **Cadre Technologies, Inc.** added object-oriented design features to the upgraded version of Teamwork 4.1, the Beaverton, Ore.-based firm's tool set for building Unix applications. . . . **Data General Corp.** released CEO 4.0, an upgrade of the office automation package for its MV minicomputer users. . . . **Austin Computer Systems** said it will begin including virus protection software from McAfee Associates with its desktop and notebook computer systems. . . . **AST Research, Inc.** clocked in with price cuts of up to 17% on its Fastboard upgrade boards. Pricing now runs from $995 for an Intel Corp. 80386DX 33-MHz model to $1,695 for the new I486DX2/50. . . . ComputerLand Corp. introduced its own line of Trion PCs, based on Chips and Technologies, Inc. processors. . . . **Leading Edge Products, Inc.** zapped its PC prices downward by as much as 20%.

More news shorts on page 16

Conrail revamps architectures

Multimillion dollar network key to outsourcing role for transport firm

BY JOANIE M. WEXLER
CW STAFF

PHILADELPHIA — Consolidated Rail Corp. has launched a $10.2 million, soup-to-nuts network infrastructure revamp as part of an effort to transform itself into a one-stop-shop transportation company.

Conrail's redesigned network and data architectures will help it shoulder the responsibility of becoming a single point of contact for customers whose shipments may traverse other railroads and transportation systems in addition to Conrail lines.

To be successful, this effort requires an airtight grasp on shipment whereabouts, said Bill Everett, manager of telecommunications planning. A new Fiber Distributed Data Interface-ready internal network infrastructure and revamped data center will position the firm to handle the corresponding anticipated explosion in data traffic, Conrail officials said.

Nick Kelsh

Conrail's Everett *is anticipating an explosion in data traffic once the new network and real-time scanning systems are operational*

New digs

For the most part, the luxury of overhauling the network is enabled by the firm's consolidation of three Philadelphia office sites into a new 29-story location, said Al Castan, Conrail's acting manager of network resources. Conrail plans to move 3,000 employees into that building in July, and a redundant data center in Byberry, Pa., will be ready for occupancy early next year, he added.

> KEY TO THE railroad's new role is the capture of real-time, accurate information from the field.

Conrail plans to re-engineer its applications and data architectures immediately after the move, Castan said. He would specify only that the effort would rely heavily on computer-aided software engineering tools and parallel-processing equipment. In addition, five 3090-class IBM mainframes will be replaced by two IBM Enterprise System/9000-class hosts.

Key to Conrail's new role is the capture of real-time, accurate information from the field, Everett said. To that end, the railroad is installing the Automatic Equipment Identification (AEI) system, a scanning system for capturing cargo location information from all vehicles and sending it directly to the mainframe. The AEI has been sanctioned by the American Association of Railroads as a standard reporting method that allows the railroad industry to exchange data and ally against its key competition: the truckers.

Castan said he expects the Conrail network to have to handle a message load increase from nearly 40 messages per second to 2,000 messages per second during the next 18 months, in large part because of AEI-generated traffic.

With efforts such as AEI, other large railroads are mirroring Conrail's efforts to become transportation logistics outsourcers — an appropriate role for them because of their considerable systems investments, according to William J. Rennicke, vice president of the rail practice at Mercer Consulting in Lexington, Mass.

"Trucking companies are more numerous but smaller," so few have the budgets to take on this role, he explained.

Everett said Conrail will soon beta-test a revamped electronic data interchange application. The more user-friendly, personal computer-based package is expected to encourage customers to invoke larger volumes of transactions and accelerate business.

To help prepare for the burgeoning data traffic, Conrail's revamp reaches down into its local-area networks. It is migrating from Microsoft Corp.'s LAN Manager network to a partially installed internetwork of 80 Novell, Inc. NetWare LANs that are based largely on Cabletron Systems, Inc. smart wiring hubs and Wellfleet Communications, Inc. multiprotocol bridge/routers.

Previously, Conrail had used another vendor's dumb wiring hubs for Ethernets and IBM's manageable Token Ring wiring hubs. However, the railroad sought wiring hubs that could both support and manage the company's mix of Ethernet and Token Ring LANs collectively, and "IBM wasn't ready to play," Everett said. To date, IBM has not announced a manageable, multimedia wiring hub.

Cabletron coup

Meanwhile, Conrail has taken advantage of Cabletron's recent rate reductions for the high-level Spectrum network management system, which Conrail began installing last week to manage 12 network elements, said Gary Morris, an external project manager from Insyt, a Miami-based consultancy that is involved in the project.

Conrail is still investigating wide-area inter-LAN technologies such as frame relay and Switched Multimegabit Data Service. Like many companies considering neophyte fast-packet-switching technologies, "we're still trying to sort out the players and offerings," Everett said.

Overall, Morris said, Conrail will remain centrally run. Novell file servers will be clustered in one centralized location and fall under the information systems department's domain. Conrail does not plan to shift from its mainframes to smaller Unix platforms, he said.

WHAT HAVE
BILL GATES,
SCOTT MCNEALY,
JOHN SCULLEY,
JOHN YOUNG
AND LARRY ELLISON
AGREED TO
COOPERATE ON?

FIND OUT ON JUNE 15TH

Price cuts move users up from SX base

BY CAROL HILDEBRAND
CW STAFF

With Intel Corp.'s I486 chip moving toward the mainstream both in price and corporate acceptance, personal computer vendors are nudging up their entry-level configurations. Many users have already left the 386SX behind for the 386DX, and some are leapfrogging the 486SX in favor of the 486DX standard.

With PC prices locked in a death spiral — IBM has reduced PC prices four times since January — and compute-intensive operating systems such as Windows and OS/2 garnering major attention, the situation appears ripe for users to bring their hardware standards up to graphical user interface levels for a negligable price difference.

Enrique Crespo Jr., corporate manager of user computing services at Torrington Co. in Torrington, Conn., said his company has moved up to the 386DX platform. "Once upon a time, it was an SX. But now PCs are cheap and getting cheaper, and you are not going to be able to grow memory or applications with anything but a true DX," he said.

Gerry Jobin, an analyst at Loyola University in Chicago, said he has just finished defining what he called the "vanilla workstation," an entry-level machine that will fit 60% to 80% of his users' needs. "It's a 386DX machine with an 80M-byte hard drive and 4M bytes of RAM," he said.

While offering 386SX-based boxes, vendors are slashing prices on their fuller featured DX machines, making them a more viable option. For example, the Compaq Computer Corp. entry-level lines, due out on June 15 [CW, May 18], will sport startlingly low price tags, with an SX street price reportedly hovering around the $700 mark.

Of the 18 users interviewed by *Computerworld*, most said a 386DX was now a minimum entry-level configuration. Recent price cuts on Intel's 486SX line of up to 58% are expected to further intensify the migration upward, observers said [CW, May 18].

That is fine with Intel. An executive last week told a Hong Kong audience that Intel is cutting the price of its 486SX chip in half in order to position it as the entry-level CPU for the mainstream PC market. "There is really no reason" for an OEM to build a 386-based PC anymore, said Albert Y. C. Yu, general manager of Intel's Microprocessor Products Group.

Chuck Davis, director of information resources at Eagle Industries, Inc. in Chicago, said he is thinking of bumping up his user recommendation to a 386DX. "The delta between an SX and a DX may narrow enough to justify a jump to the next level," he said, adding that a gap of $200 to $300 would be low enough to make him upgrade.

One rung on the migration ladder that users seem to be skipping is the 486SX. Many cite the chip's lack of a math coprocessor, saying all it basically offers is added cache memory.

Charline Avey, network manager for the engineering department at Indianapolis Water Co., said that the company's entry-level machine is a 25-MHz 386DX, but she has been trying to persuade people to bump up to the 486DX platform and bypass the 486SX offering.

"I think it was really a mistake to bring out the SX," she said. "With the 486, you want speed, so why cripple it by removing the coprocessor?"

Charles Darnell, chief information officer at Conyers, Ga.-based Lithonia Lighting, agreed, "I think we'd skip over that [platform] because it doesn't give us the right price/performance ratio." Darnell is currently standardized on 386SX 20-MHz machines but recently bought more than 1,000 upgrade boards from AOX, Inc. to bump up desktop performance levels.

However, the 386SX has not hit the skids. Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., pointed to new cache version chips from Cyrix Corp. and IBM as well as a second-life popularity in the notebook realm as signs that the processor is not yet moribund.

Many users still standardized on the 386SX platform cited price as the main incentive. Michael Mourey, manager of technical support at Indiana Purdue University in Fort Wayne, said that with users paying for PCs out of their departmental budgets, he recommends a 386SX configuration as a minimum.

Computerworld Hong Kong *contributed to this story.*

Intel to go retail route

BY MICHAEL FITZGERALD
CW STAFF

FOLSOM, Calif. — Tomorrow Intel Corp. will push into a new frontier for microprocessing: retail sales.

Intel is expected to announce its OverDrive Processor family — a line of clock-doubling I486 chip upgrade products to be sold directly to consumers through retail stores and computer dealers.

Intel's first two OverDrive processors will be a $549 version for use in systems equipped with 16-MHz or 20-MHz 486SX processors and a $699 version for a 25-MHz 486SX system. Intel will support the chips through a toll-free number.

The chips plug into a Performance Enhancement Socket that Intel has encouraged vendors to use for some time.

Most systems vendors, including IBM and Compaq Computer Corp., already support the architecture.

Intel will offer DX and DX2 OverDrive chips later this year as well as build P5 versions.

Compaq stalks hosts with SystemPro revamp

CONTINUED FROM PAGE 1

nent failure alerts and system logs that were previously unavailable for personal computer servers (see chart).

The tools will be bundled with the SystemPro at no extra cost. Compaq will also sell it for $695 to users of non-Compaq servers.

Users said they want to see the new offerings before signing on.

"We have some interest in that, but technically, I have some reservations about their ability to do it," said Rick Meacham, end-user computing manager at Nationsbanc Services, Inc. in Nashville.

"Here's a company with no software capabilities in the industry moving heavily toward software," agreed Jack Karp, vice president at Meta Group, Inc. in Westport, Conn.

Ronnie Ward, Compaq's director of product development for the Systems Division, said the company has the skills it needs. "We have over 100 systems engineers that . . . do that kind of work," he said. "We have the resources."

Compaq and some users noted its Network Manager board, now renamed the Server Manager/R, came out last July and has worked as claimed.

Several users said they think Compaq has finally learned how to handle SystemPro. "Three years ago, I thought they had unrealistic expectations of what was going to be required to compete in the minicomputer world," said Glenn Sandusky, chief information officer at benefits consultancy and major SystemPro user Miller Mason & Dickenson in Chicago. "This shows that they're moving in the right direction."

Also scheduled for June 8 is a deal to bundle Novell, Inc.'s NetWare with SystemPro, sources close to Compaq said.

Later announcements will focus on NetWare diagnostics that will tie in with Novell's coming NetWare Management System and the third-quarter debut of its System Fault-Tolerance Level III (SFT III) NetWare.

"SFT Level III, a higher number of processors, [advanced error-correcting code] and more advanced diagnostics utilities would allow me to effectively replace our mainframe computers, if . . . the I/O bottleneck is improved," said Louis Kahn, network administrator at the Centers for Disease Control's division of immunization in Atlanta.

Stimac said Compaq will continue to use the current version of the Extended Industry Standard Architecture I/O bus but will develop specialized data transfer buses to attempt to relieve data transfer pressure.

Users who have already replaced mainframes with LANs liked the sound of the Compaq strategy. "That could be great," said Bill Lodge, project leader at Turner Corp., a construction company that moved its mainframe applications over to largely non-Compaq-based LANs.

Full agenda

Compaq is gearing up to unleash a broad array of SystemPro products and enhancements:

- **100 MIPS capabilities and support for Intel's coming 586 chip.** Delivery: end of 1992.
- **SystemPros with up to four processors that run at 200 MIPS and support 50G bytes of disk space.** Delivery: 1993.
- **Expansion of the low-end LT line.** Delivery: 1992.
- **Overhaul of all system components in an effort to improve server availability.** Delivery: now through 1995.

Japan's sneak peek

Compaq's Japanese subsidiary last week announced three of the five notebooks that Compaq will introduce in the U.S. on June 15, including its first color notebook.

The three products include the following features:

- **LTE Lite/25C.** A 6½-pound notebook with an 8.4-in. active-matrix color display. It is based on Intel Corp.'s 25-MHz 80386SL processor, which has 64K-byte cache, 4M bytes of random-access memory (expandable to 20M bytes) and either an 84M- or 120M-byte hard drive. Nickel-metal hydride batteries last up to four hours.

The LTE Lite/25C also features EasyPoint, a trackball attached to the display with mouse-like buttons on the back of the display.

- **Contura 3/20 and 3/25.** These 6.2 pound notebooks use Intel's 20-MHz and 25-MHz 80386SL chips. The 3/20 has 2M bytes of RAM standard (expandable to 10M bytes) and will have 40M- and 85M-byte hard drives. The Contura 3/25 has 4M bytes of RAM (expandable to 12M bytes) and comes with either a 60M- or 120M-byte hard drive. Nickel cadmium batteries last up to 3½ hours.

Compaq is also expected to announce two low-end 386SX-based notebooks and two new desktop lines [CW, May 18]. The company confirmed that the Japanese products are comparable to the coming U.S. products, adding that U.S. pricing was not available. A spokesman said the Contura line will target the mass-merchant channel.

Compaq's SystemPro family will get a major facelift this year, said Gary Stimac, Compaq's senior vice president.

The SystemPro line will expand on the high end to include a 100 million instructions per second system with up to four chips. They will use both Intel I486 chips and the coming P5, or 586.

On the low end, sub-$5,000 SystemPro/LTs will come. Compaq will add a specialized RAM that will protect data errors on the chip level, mirrored file servers and a drive array capable of redundant arrays of inexpensive disks Level 5 support.

MICHAEL FITZGERALD

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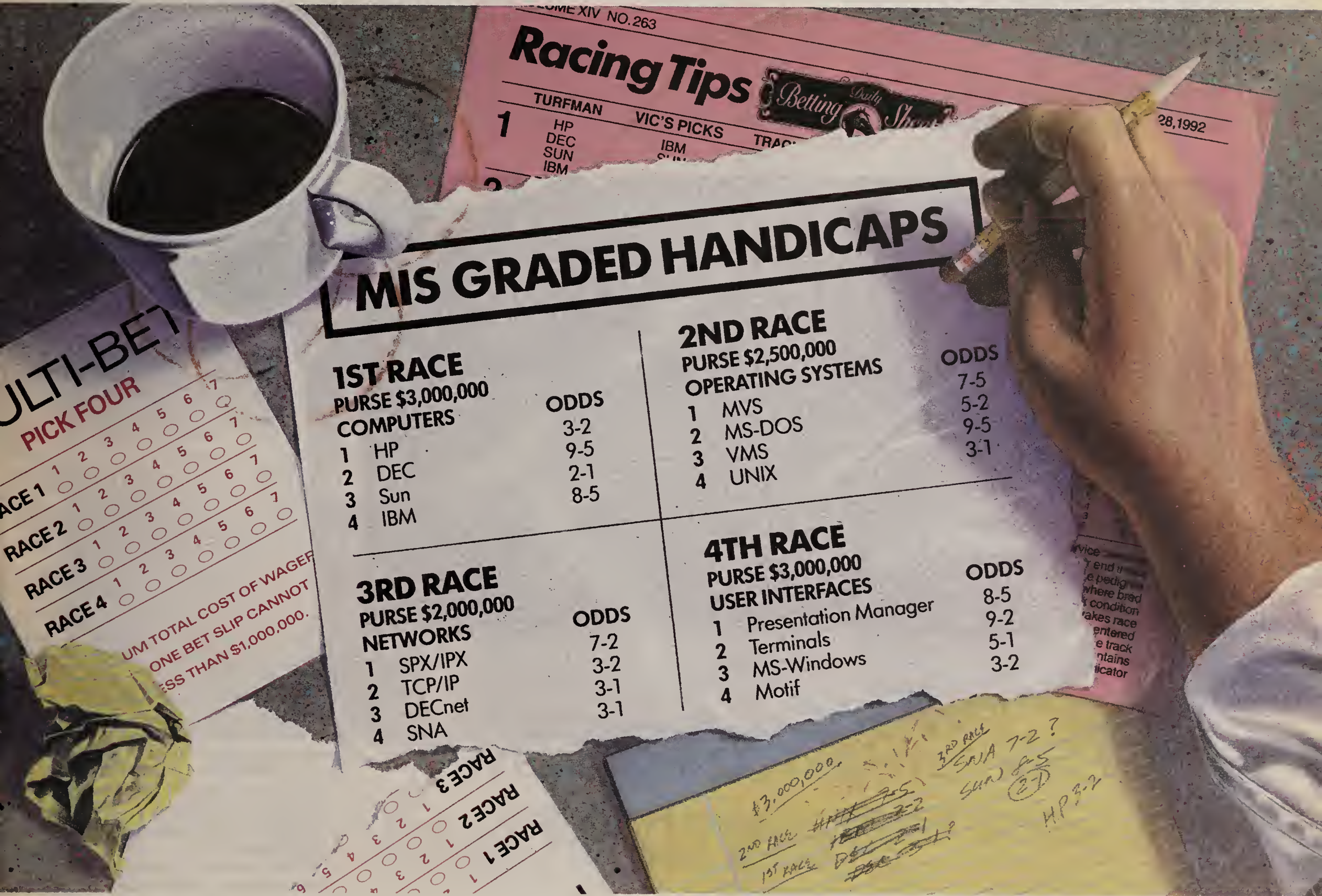

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Legent sets integration plans, outlines its Unix products

BY GARY H. ANTHES
CW STAFF

ORLANDO, Fla. — Enthusiasm was tempered by questions last week as Legent Corp. customers analyzed the company's planned merger with Goal Systems International, Inc.

Legent executives outlined consolidation and migration plans in interviews with *Computerworld* during the company's annual user conference. Some users said they were concerned about how the data center software company would combine its product lines with Goal's, particularly in areas of overlap.

"The merger is very exciting to us," said John M. Jakymiw, a systems availability management technician at Kemper National Insurance Cos. in Long Grove, Ill. He said Kemper, which has a number of products from both vendors, wants to more tightly integrate its systems. The merger "is a step in the direction of supporting our integration strategy," Jakymiw said.

Legent President John F. Burton acknowledged some users' concerns about what the merged companies will do with redundant products. Legent and Goal sent letters to users last month saying two pairs of product families — for automation of data center operations and output management — will be merged with full upward compatibility from their preceding product lines.

Burton *promises full compatibility*

Burton said Legent will provide automated tools to help users move to the new combined products, which will be available in one to two years. He said Legent will have a migration blueprint available for users by the end of July.

Vienna, Va.-based Legent, with sales last year of $203 million, has products in information systems business management, data center operations management, systems resource management, network management and software management. Goal, which had sales of $128 million last year, focuses on software to support operations management, performance management and computer-based training.

One user who asked not to be named said his company was considering buying additional tools from both companies but would wait to see how things play out.

Burton said Legent is also well under way in an unannounced project to port its products to Unix. He said he expects to move Legent's Endevor software management product to Unix in less than a year. Initial target environments under consideration are reduced instruction set computing-based boxes from Hewlett-Packard Co., Sun Microsystems, Inc. and IBM, Burton said.

"We want Legent to be a [Unix] player," said G. B. Wise, a senior systems analyst for MVS systems at Shell Oil Co. Wise said Shell is a "heavy user of Legent tools" in its "blue," or commercial, operations.

AMR exec crosses over to Frito-Lay

BY ELISABETH HORWITT
CW STAFF

PLANO, Texas — Frito-Lay, Inc. has appointed James E. Juracek, vice president of systems engineering at AMR Corp., as its new head of MIS, the firm announced last week.

The move to Frito-Lay is "a tremendous opportunity because Frito is absolutely the dominant player in the snack food industry and on the technological leading edge," Juracek said. "It's like becoming the new manager for the [New York] Yankees."

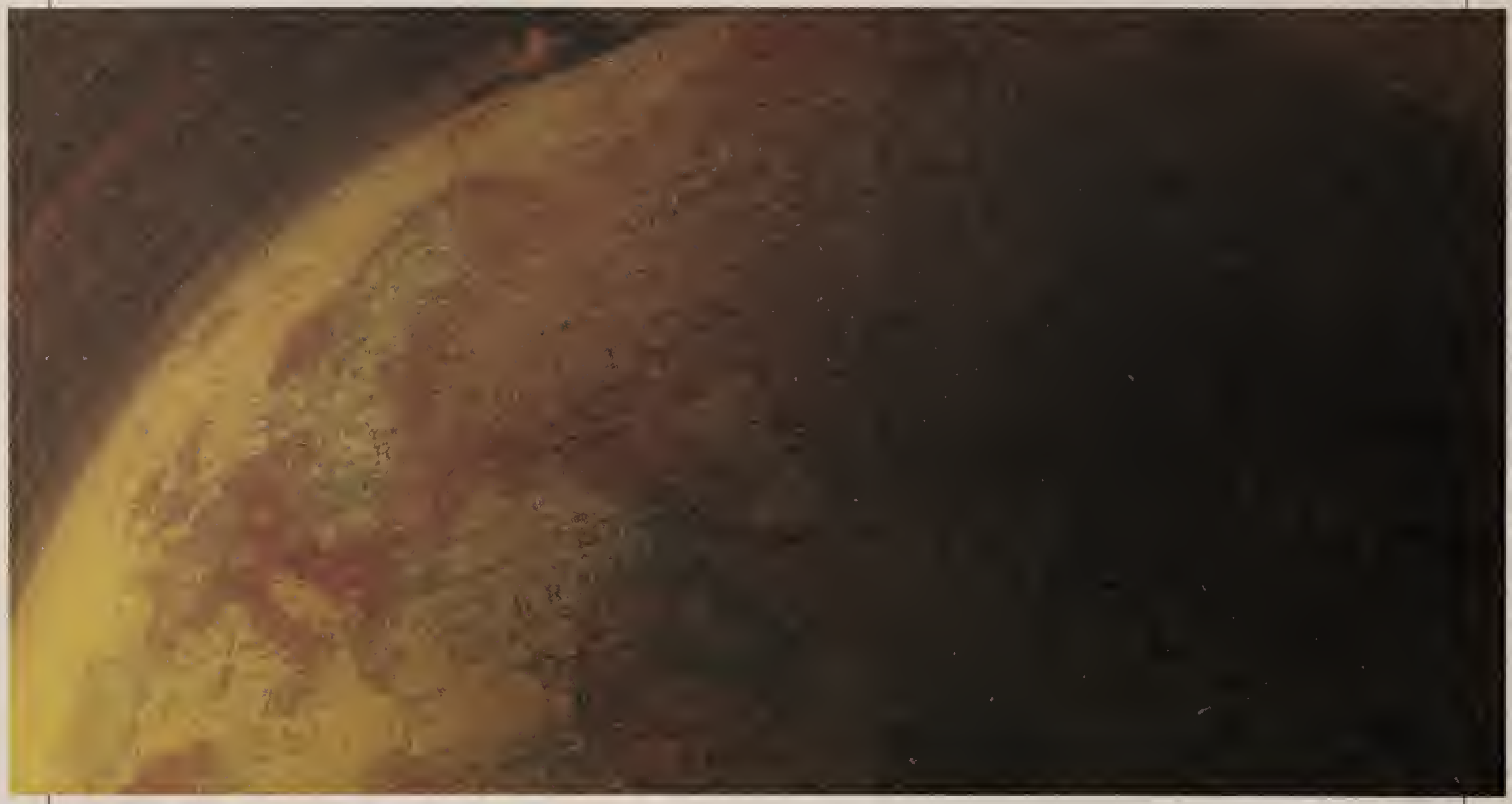
While conceding that he would "have some learning to do" in a completely different industry, Juracek expressed confidence that his "management and technical skills will be applicable in a retail environment."

During his five-year stint at AMR, Juracek headed the development of the Sabre reservation system and continued to have full responsibility for the system and its underlying network.

Indeed, Juracek leaves a lot of irons in the fire at Sabre. The company is currently in the midst of massive migrations to an X.25 network and a multivendor client/server system, he said.

Juracek officially begins at Frito-Lay in mid-June, reporting to Chief Financial Officer Michael White. He will replace Charles Feld, who resigned as Frito-Lay's vice president of MIS earlier this year.

AMR has yet to determine his successor, the company said. William Coyne, managing director of computer systems, is acting as Juracek's replacement in the interim.



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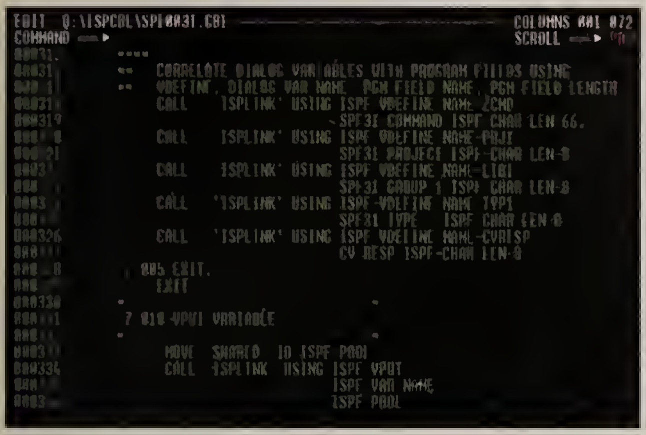
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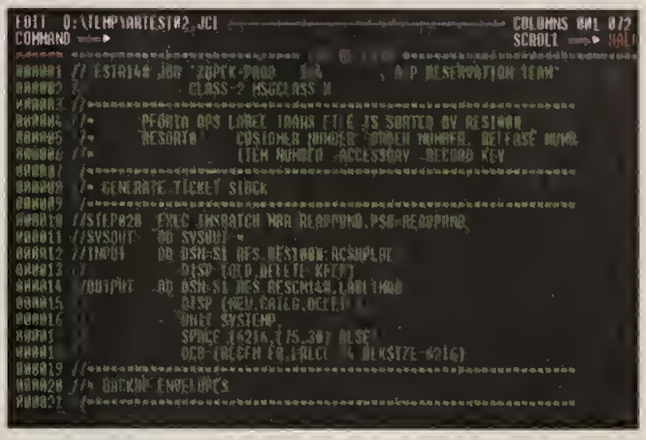
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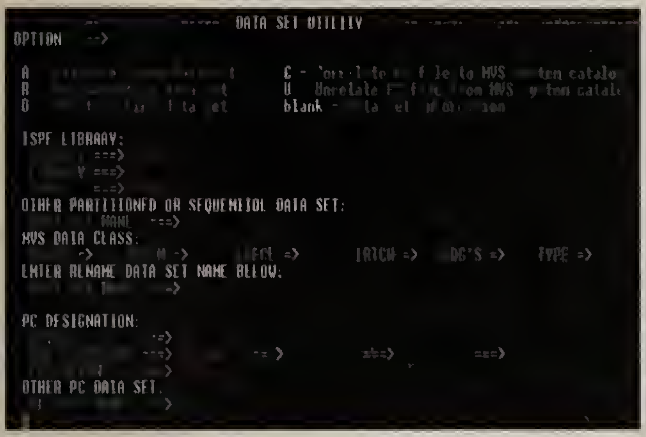
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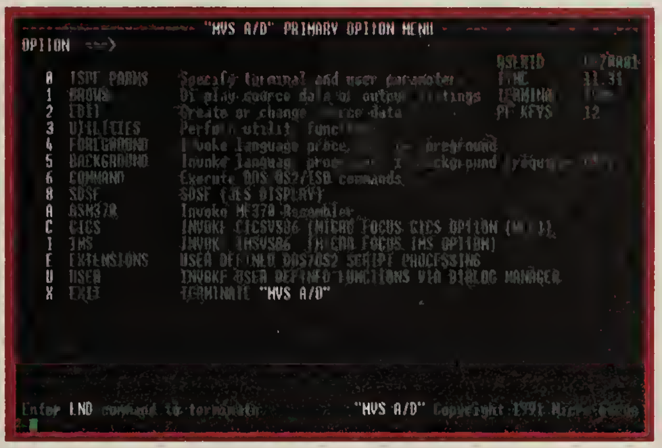
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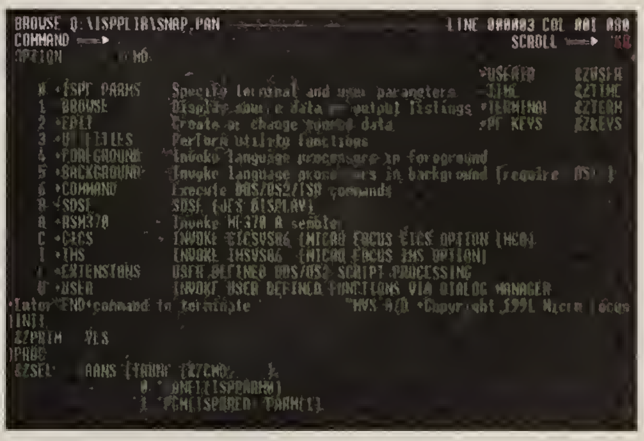
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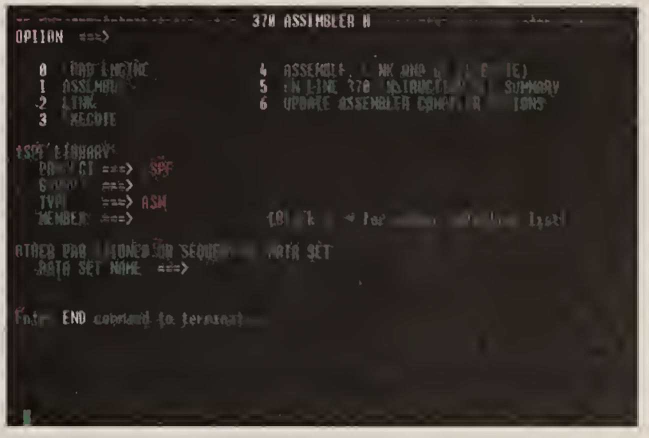
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HP pits RISC against IBM

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Hewlett-Packard Co. took its reduced instruction set computing (RISC) strategy into the data center last week, unveiling a line of high-end systems that are positioned against IBM mainframes.

HP executives claimed the HP 3000 and HP 9000 air-cooled machines cut operating, maintenance and support costs by 80% compared with traditional mainframe computing.

The machines are also said to offer 60% to 70% better performance than HP's current high-end machines.

Pleased all around

HP users liked what they saw. "We've ordered two" HP 9000 servers, said John Cooper, senior vice president of information systems and operations at Liberty Bancorp, Oklahoma's largest bank holding company, based in Oklahoma City. He said Liberty will upgrade to two HP 9000 Series 877 systems later this year.

"I'm impressed with the processing power," said Bill Nadzak, HP program manager at FMC Corp., a Chicago-based manufacturer. Nadzak said the company's decision to purchase an HP 3000 Model 990/200 enabled the firm to eliminate smaller HP boxes in the field.

HP's scalable approach to system upgrades pleased Rodger Lindquist, manager of information services at Dreyer's Grand Ice Cream, Inc. in Oakland, Calif. "You can upgrade to a more powerful machine without changes to your software," said Lindquist, whose shop recently upgraded to an HP 3000 Model 960 from a Model 955.

The HP 3000 systems run HP's Posix-compliant proprietary MPE/IX operating system, and the HP 9000 servers run the HP/UX version of Unix.

Ready, aim, fire

Digital Equipment Corp. customers are a secondary target for HP as DEC struggles to get its own RISC-based Alpha machines on the street. DEC's Alpha-based machines are not expected to begin shipping until next year. Meanwhile, HP is expected to integrate its new Alpha-type RISC chip in its high-end machines by year's end.

Analysts were upbeat about HP's chances.

"They are finally able to get machines at the high end to compete against mainframes at a much lower cost," said Kate Nessenden, a senior analyst at Meta Group, Inc., a market research firm in Westport, Conn.

Sun's built-in ISDN box SPARCs interest

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week unveiled its long-awaited next generation of SPARCstation systems consisting of four new machines built around the SuperSPARC Viking chip from Texas Instruments, Inc.

Sun surprised critics by introducing more powerful systems than were anticipated, including what is said to be the first workstation with built-in Integrated Services Digital Network (ISDN) capabilities. The new product rollout includes a pair of two- and four-processor desktop workstations slated to ship late this year and early next year.

"I'm impressed that Sun is getting really close to what database users need," with improved disk performance, said Barbara Kostinick, MIS director at Consumer Health Services, Inc. in Boulder, Colo.

The SPARCstation 10s are two to four times more powerful than current SPARCstation 2s. They also quadruple the speed at which data can be processed through memory and more than double the rate of data retrieval from disk storage devices. "We're also excited about the ISDN capability because we run a large telecommunications facility here," Kostinick added.

The SPARCstation 10 comes in four workstation models, priced from $18,495 to $57,995, and four server configurations, priced from $16,995 to $55,295. These midrange Unix workstations are aimed at power users in both commercial and technical markets, Sun President Scott McNealy said. "We're going to be all over the place. Deal with it, competitors."

Rivals such as Hewlett-Packard Co. are already dealing with it, some users said. "I see the Sun announcement as too little, too late. Although for Sun worshippers I'm sure it sounds great," said Robert Grandle, a systems manager in the acoustics division at NASA Langley Research Center in Hampton, Va.

Grandle said Sun's emphasis on investment protection, hardware upgradability and application performance "sounds like the same tired story DEC is playing out. It's the story you give when you aren't the fastest on the block."

While Sun's CPU clock speeds of 36 MHz to 45 MHz on the SPARCstation 10 models are lagging behind competitors IBM and HP, other performance ratings for system throughput indicate a leading position for Sun, analysts noted (see chart). "I think the key point for all users is to benchmark your own code on IBM, HP and Sun," said Darren Curtis, a system manager at Battelle, Pacific Northwest Laboratory in Richland, Wash. "Sun is still the No. 1 user machine as far as I'm concerned."

Head-to-head

Sun pits its midrange Unix workstation against comparable systems from its chief competitors

Configurations here include 16-in. color, 32M bytes of memory and approximately 400M bytes of disk space

	Sun SPARCstation 10 Model 30	HP HP 9000 710	IBM RS/6000 340H
Clock rate	36 MHz	50 MHz	33 MHz
CPU upgradable card	Yes	No	Yes
MIPS, MFLOPS	86.1, 10.6	57.9, 12.2	NA, 14.8
Internal disk	424-848M bytes	0-840M bytes	160M–2G bytes
I/O bus architecture expansion slots	4	None	4
Price	$19,495	$15,065	$26,675

Source: Sun Microsystems, Inc. and IBM

CW Chart: Janell Genovese

DECstation users fear abandonment

CONTINUED FROM PAGE 1

that coexists well" with OSF/1.

"We will enable customers to build a computing environment [that will let] them migrate on their terms from Mips to Alpha," Yeaton said.

Several users said that although they are disappointed to see the DECstation line heading for a dead end, the portability of applications developed in C or C++ can ease their transition to other vendors' Unix platforms. "I'm not sure I care, at this moment, about another version of Ultrix or if the DECstations become obsolete," said John Steward, MIS director at the Public Securities Association in New York. The financial trade association is wrapping up a conversion from Wang Laboratories, Inc. machines to a DECsystem running Ultrix.

"I know there are other Unix platforms where I can run my software, such as IBM, Sun, Hewlett-Packard and, of all places, Prime," Steward added.

Yet for users such as Homer Hoe, information systems manager at Tenneco Minerals Co., DEC's change of heart is alarming. Hoe was counting on migrating his Ultrix applications to OSF/1 but staying on the Mips-based platform.

"Right now, the Mips chip gives me all the horsepower I need. I'm not screaming for better, faster hardware but for more timely and robust applications," Hoe said.

Another factor playing against the DECstation line is a political one: the pending acquisition of Mips by workstation competitor Silicon Graphics, Inc.

"The Mips line is obviously a lame duck," said Jeffry Canin, an analyst at Montgomery Securities in San Francisco.

"The fact that OSF/1 won't be there on the Mips platform is a bit of a disappointment, but it's something we were prepared for," said Sholom Bryski, senior vice president at Bankers Trust Co. in New York, a major DEC VAX/VMS shop that took a cautious approach to Unix.

"We bought about 30 DECstation 3100s and 5000s, and we banned any of the larger Unix processors," Bryski explained. The bank limited Ultrix development to isolated pieces of code and steered clear of putting any production or mission-critical applications on the DECstations.

At Allied General Agency, Inc., an insurance business in Scottsdale, Ariz., with three large DECsystems installed, the hardware is less of a concern than software, systems manager Bill Brown said. Upgrading to the Mips R4000 processor or to an Alpha system, he said, sounds like "a big waste of money.

"I want faster disk, better terminal servers, networking and database access," Brown said. "I like DEC and don't want to change, but if there is some benefit in moving to another Unix platform, our software is portable enough to do it."

DEC heats up distributed OLTP market

BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp. will announce plans to extend its online transaction processing technology to a variety of non-DEC servers later this summer, sources close to the company said.

DEC is expected to announce versions of its Application Control Monitor System (ACMS) transaction processing technology that support Microsoft Corp.'s Windows New Technology and OSF/1 servers based on DEC Alpha chips. It is also expected to formalize LU6.2 connections to IBM's CICS.

Sources said ACMS will ultimately run on other versions of Unix in addition to OSF/1.

Separately, DEC is developing a version of the DEC Distributed Transaction Manager that will support the X/Open Consortium Ltd.'s XA interface, allowing for a single transaction to update multiple resources.

"Distributed transaction processing is a very hot item for us," said Blayne Maring, assistant vice president of architecture at GTE Telephone Operations in Irving, Texas. "I'd like to be able to put up a heterogeneous network and be able to frame transactions across the desktop with integrity taken care of as part of a ubiquitous TP monitor."

DEC officials are also completing discussions with Transarc Corp. that could lead DEC to license portions of Transarc's distributed transaction processing technology, according to industry sources.

The deal is expected to be finalized by the fall. Transarc developed extensions to the Open Software Foundation's Distributed Computing Environment Remote Procedure Calls (RPC) to include a transactional RPC.

Transarc officials refused to comment on the deal. However, they said they have extended DEC's distribution services to allow a single transaction to update databases running on different machines with integrity controls.

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Air transport industry flying the OSI banner

BY ELISABETH HORWITT
CW STAFF

CAMBRIDGE, Mass. — Air transport may become only the second industry to undertake a wholesale migration to the Open Systems Interconnect (OSI) standard, following the lead of the U.S. government.

First, however, the International Air Transport Association (IATA) must persuade its financially troubled member airlines to undertake a costly systems overhaul that it hopes will realize long-term, often unquantifiable benefits.

Last week's meeting of the international airline and aviation industry group resembled a revival meeting, as airline officials exhorted colleagues to jump on the OSI bandwagon for the good of the industry. The centerpiece of the meeting was the Airline OSI Profile, a set of guidelines for OSI-based interoperability across the airlines.

Developed by the IATA's Architecture Strategy Group, with input from almost 20 air carriers worldwide, the document should be approved by ballot by early August, the IATA said. The architecture will include OSI routing and global addressing protocols, along with X.25 for the underlying connections, according to Paul Hennig, a staff engineer at United Air Lines.

Companies that do not start implementing OSI will soon find it increasingly difficult and expensive to communicate with the rest of the industry, John C. King, vice president of communications and information services at Delta Air Lines, warned in his keynote address.

OSI now a reality

Behind the IATA's OSI push is a growing realization on the part of airlines worldwide that OSI is the most effective way to ensure communications, said Gordon Lew, a systems engineer at American Airlines.

"A lot of people have tended to view OSI as mythical and in the future and TCP/IP as here now," Lew said. "However, 90% of TCP/IP manifestations are on the LAN, while OSI is for both LAN and wide-area network communications."

In parallel with the IATA's Airline OSI Profile effort, a separate consortium is working on the Aeronautical Telecommunications Network (ATN), an OSI- and X.25-based architecture designed to facilitate communications between aircraft and ground-based airline and air traffic control systems.

Active members of the project include the Federal Aviation Administration (FAA) and an assortment of computer vendors and airline network service providers. However, American and United Air Lines are the only two airlines currently participating. Hennig used the IATA podium to urge other airlines to adopt ATN.

ATN would enable aircraft to stay in touch with one another and with air traffic control on an ongoing basis as they fly overseas, Hennig said. This would allow aircraft to change flight patterns dynamically in response to changing weather conditions and wind patterns, saving fuel and time and increasing passenger comfort, he added. Right now, aircraft must keep far apart in strict flight paths because "the old systems can't communicate," Hennig said.

However, OSI implementors who took the floor last week were frank about the expense and time associated with implementing the standard on current proprietary systems. American's X.25 migration, already a couple of years along, is expected to take as much as two years to complete, Lew said.

United expects to take about three years to implement ATN on its current Unisys Corp. hosts, Hennig said.

Speakers also acknowledged that it is next to impossible to formulate a short-term return on investment (ROI) for moving to OSI. And as one attendee pointed out, lack of ROI will make it hard for data processing departments to sell OSI to their managements.

Delta debates

Speakers at last week's IATA conference outlined the following pros and cons of OSI migration

PROS

- Standard APIs save program development and training costs.
- OSI protocols are better designed than current "standards" to support any-to-any links.
- Modularlity paves the way for future migration to emerging network technologies, such as frame relay.
- Industrywide adoption of OSI would facilitate new connections between different parts of the industry.

CONS

- Too costly to replace current communications equipment and software.
- Upper level protocols still not finalized.
- Benefits are a decade away.
- TCP/IP is here now, and it works.

The $40,000 bolt from the blue

CONTINUED ON PAGE 1

The vendor also said the vast majority of these problems are low-level surges or sags. However, even minor disturbances often cause data loss, system glitches and invisible wear and tear on disk drives or network boards, said Jim Cerwin, a product sales manager at communications system distributor Anixter Brothers, Inc.

Gartner Group, Inc. has concluded that power disturbances are often behind common LAN problems, according to Bill Redman, a vice president at the Stamford, Conn., research firm.

Unprotected LAN

Furthermore, traditional surge protection devices that concentrate on the power grid leave the LAN vulnerable. Even installing a surge protector at each PC on the LAN may not be sufficient because the surge may choose the LAN as the most attractive path to the ground, according to Panamax, a San Rafael, Calif., vendor of power protection products for LANs.

This is what happened to the Association of Field Service Managers when lightning caused a power surge on the Fort Myers service company consortium's Token Ring LAN. The surge destroyed components on 12 PCs, six printers and the association's private branch exchange system — to the tune of $16,000.

"We had power protection on our AC outlets but not for the LAN," said George Keller, executive vice president at the association. "Now we have it on both."

Irvine, Calif.-based Irvine Engineering thought it had enough LAN protection from a power filtering system in the computer room that housed its servers — that is, until it began to experience power outages every few months in one of the 30 closets where the LAN hubs reside, said LAN manager Dennis Bogart. Irvine Engineering is moving to put uninterruptible power supplies (UPS) in all phone closets.

Robert Neubecker

Dangerous assumptions

Many users wrongly assume that all UPS devices include a surge suppressor or power conditioner, Redman said. However, some UPSs are simply battery systems that provide backup when the power goes off.

The McFarland Clinic p.c. in Ames, Iowa, had a UPS for its mainframe but no power protection at all when a power surge swept across its IBM terminal-to-host network, hitting 21 terminals out of 100.

"We lost the terminals, period," said Sandy Berk, the clinic's IS director. "The logic boards and keyboards were salvageable but nothing else." At a loss of nearly $30,000, "we are definitely getting power protection," she said.

Companies such as Panamax, American Power Conversion Corp., Bravo Communications, Inc. and Black Box, Inc. have begun to sell devices that are said to be specifically designed to protect LANs, as well as power outlets, against surges.

DEC hit by Du Pont downsizing

BY NELL MARGOLIS
CW STAFF

WILMINGTON, Del. — Du Pont Information Systems' ongoing move to banish redundancy has inadvertently landed yet another blow on an already beleaguered Digital Equipment Corp. The chemicals giant's complement of VAX centers, 150 a year ago, will be down to 75 by the end of the year.

Even more chilling for DEC: Du Pont's target is to get down to 10, said Michael B. Emery, IS senior vice president.

While declining to specify a time frame for achieving that goal, Emery emphasized that DEC is far from alone in feeling the edge of the Du Pont axe. "We're looking at our five IBM data centers to see if we really need all of them," he noted.

Reducing redundancies

Since the company's 1991 decision to shrink its estimated $1 billion annual computer and telecommunications technology tab by $205 million, a slew of systems, software and services have been labeled dispensible.

In addition to this, Du Pont Information Systems has consolidated a wide range of redundant applications and pared an approximately 3,025-person worldwide payroll by 225 people through attrition.

And earlier this month, the firm announced that 275 more IS jobs will be cut this summer. Between next week and July 31, employees will be able to opt for early retirement, Emery said. If 275 IS employees do not volunteer, he said, "involuntary measures" will kick in.

Bigger picture

Du Pont Information Systems, Emery said, sees its slimmer shape as only the first step in a larger reevaluation.

"In the past months, we have also evaluated the role of IS within the company," he noted. "What we found is, we're not just an order-taker here to deliver technology on demand. And we're not just an automater; to begin with, there are some things that shouldn't be automated."

Rather, he said, "We're moving away from a service organization to something new." That something defies slick description, Emery said, but it has two clearly defined guiding principles: "On one hand, we're trying to be truly outstanding technologically. But the true measure of everything we do is, did we increase business value?"

DEC links with Ram Mobile, launches wireless strategy

BY ELLIS BOOKER
CW STAFF

ATLANTA — The crowded airspace of wireless data networking will soon include systems and services from Digital Equipment Corp.

DEC swooped into the wireless arena at last week's International Communications Association show, announcing both a marketing alliance with a wireless network carrier and a systems integration program for users.

DEC officials also hinted that they were considering the development of portable computers specifically designed for wireless applications.

"Our strength for the past 10 years has been in networking . . . and we view mobile data as an extension of enterprise networks," said Terri Richardson, DEC's worldwide business development manager for mobile data.

DEC's first wireless product, scheduled for availability in the first quarter of 1993, will be a wireless, two-way, electronic-mail option for its All-In-1 integrated office environment. DEC said it was developing a wireless version of Mobilizer, a software package that provides remote DOS computers with access into All-In-1 resources. There are currently more than 3 million All-In-1 customers, DEC said.

Sealed deals

DEC's wireless E-mail will use the nationwide wireless network run by Ram Mobile Data. Ram Mobile, with radio frequency-based packet data networks in 50 U.S. cities, is one of two nationwide packet data wireless carriers in operation today. The other carrier is Lincolnshire, Ill.-based Ardis, a joint IBM and Motorola, Inc. venture. Ram Mobile is a joint venture between Ram Broadcasting Corp. in New York and BellSouth Corp. here.

While Ram Mobile and its network are clearly a major part of DEC's strategy, the relationship is not exclusive. In announcing its DECmobile systems integration program last week, DEC stressed that it would offer users a variety of solutions for end-to-end wireless networking. One of those solutions could even be IBM's CelluPlan 2, a technology for sending packet data over analog cellular telephone networks that IBM and nine cellular carriers will test this summer.

Richardson said her organization plans to study the data-over-cellular technology as details are released. Another possibility for DEC's entry into the wireless market could be a new generation of portable computers, but Richardson declined to comment on when DEC might introduce such machines.

"From a systems integrator perspective," she said, "there are a lot of suitable devices on the market today."

DEC already has strategic relationships with Fujitsu Personal Systems — formerly Poqet Computer Corp. — and Husky Computers, Inc. Laptop, palmtop and pen-based computer vendors have uniformly recognized the synergy between their mobile systems and wireless technology.

DEC also signed an agreement last October with Ericsson Mobile Communications AB, which provides the RF modems used to access Ram Mobile's wireless network. Ram Mobile's network uses the Mobitex protocol, an open standard developed by Ericsson and Swedish Telecom.

Robert Rosenberg, president of Insight Research Corp., a market research company in Livingston, N.J., cautioned that the "explosion of data transport and marketing announcements" in the wireless market does not point to which technology, vendor or alliance will win in the end.

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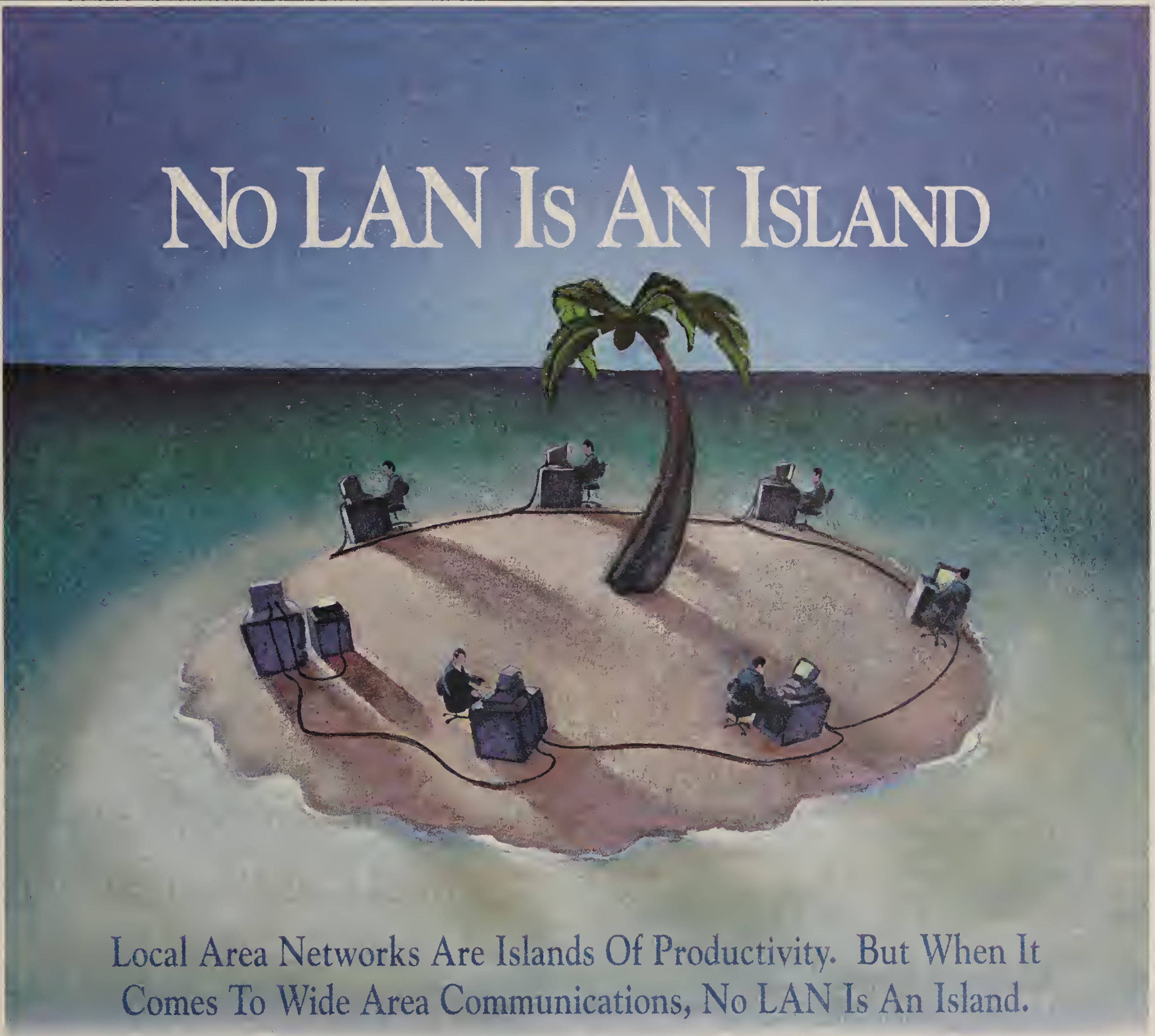
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NEWS SHORTS

Novell expands LAN monitoring

Novell, Inc. announced that its LANtern local-area network monitoring system will support Remote Network Monitoring, the Simple Network Management Protocol specification for collecting LAN monitoring and analysis data. In addition, the enhanced LANtern will be available as a NetWare Loadable Module. This will enable Novell servers to collect traffic statistics on all attached LANs; it also expands NetWare Management System's troubleshooting and network mapping capabilities to a variety of LAN protocols, Novell said.

. . . .

MCI widens international ties

MCI International, Inc. announced agreements with seven international telecommunications companies, under which MCI's Global Advantage service will provide one-source ordering, provisioning and management for the carriers' private-line services. The carriers include the Swiss, German, French and Spanish Postal Telephone and Telegraph authorities, as well as network services in Italy, Chile and Costa Rica. MCI now has one-stop agreements with 19 overseas carriers.

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Better videoconferences — when?

Vidicom in Thousand Oaks, Calif., and GCTechnologies Corp. in Japan announced a new generation coder-decoder that, they said, significantly improves videoconferencing quality over long-distance links ranging from low-speed dial-up to T1 lines. It complies with the CCITT PX64 standard for digital video compression. Pricing and availability were not announced.

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IBM cuts due in Boca Raton

IBM has quietly cut between 300 and 400 workers at its Entry Systems Division and Entry Systems Technology Group in Boca Raton, Fla. An IBM spokesman said the company has given notice to a group of support workers that they can take early retirement, an unpaid leave of absence or reassignment within the company. An IBM spokesman said no OS/2 programmers or hardware engineers were targeted.

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Acer debuts multimedia machine

The Acer Group mixed consumer electronics with computing last week with the announcement of the Personal Activity Center. The center comes equipped with an answering machine, telephone, fax machine, alarm clock, compact disc/read-only memory drive and stereo features, among others. The 80386SX-based machine also comes preloaded with several applications, including DOS, Microsoft Corp.'s Windows 3.0 with Multimedia Extensions and Microsoft Works. Available now, the center is priced at $2,295 to $2,695.

. . . .

Software AG embraces Macintosh

Software AG of North America, Inc. will release software by the end of the year that links its database and application development technologies with the Apple Computer, Inc. Macintosh. The Macintosh will become an integral part of Software AG's Entire architecture for integrating graphical user interfaces into a client/server setup. Software AG also said it is working on a number of Macintosh products, including a desktop version of the Natural 4GL.

. . . .

Short takes

Hitachi Data Systems Corp. has announced its first installation of an HDS EX 210 "Summit-class" mainframe — six months ahead of schedule — at Ericsson Data Services Nederland BV. . . . The top spot at systems integrator **Technology Solutions Corp.** is now a two-seater: Chairman **Albert Beedie Jr.** and President **Melvyn Bergstein** have been named co-chief executive officers of the Chicago-based firm. . . . **IBM** and **Comshare** have announced plans to define a technical environment for integrated decision support applications under IBM's Information Warehouse. . . . **RasterOps Corp.**, a maker of professional imaging products, has agreed to acquire desktop video production vendor **Truevision, Inc.**

EDS lands big chain store deal

10-year pact with Smith Food & Drug eliminates job of retailer's IS chief

BY MARK HALPER
CW STAFF

SALT LAKE CITY — Electronic Data Systems Corp. last week captured an estimated $160 million, 10-year, distributed processing outsourcing job with Smith Food & Drug Centers, Inc., a move sure to mute its client/server critics.

It also cost Smith's former information systems chief, Donald Hillery, his job. His position was eliminated as a result of this contract, and he has left the company. Another 120 Smith IS employees will transfer to EDS.

The Dallas-based services company's contract with Smith, a $2.21 billion retail operation, is said to be the first of two retail sector outsourcing projects that EDS will soon announce.

Robert Allen, president of EDS' commercial services business unit, told analysts two weeks ago in Dallas that EDS is on the verge of closing a contract with a large national chain. Analysts estimated that that deal will carry a $500 million price tag.

New strategy

EDS overhauled its retail strategy a year ago in an effort to win more business in the wake of IBM's outsourcing win with jewelry chain Zale Corp. in Irving, Texas. The company adopted a soft-sell approach whereby it pitches business re-engineering that could lead to outsourcing jobs.

The Smith contract calls for EDS to move the 109-store food and drug chain off Smith's 3084 IBM mainframe in Salt Lake City and onto a Unix-based distributed computing platform, said Smith Executive Vice President Robert Bolinder.

EDS will first move operations to mainframes at one of its own computer centers, a process that will take about six months. Bolinder said he was not sure how soon EDS would bring the Unix platforms on-line. Unix hardware and software details were not available.

The win comes as some observers are openly questioning the ability of mainframe-rooted EDS to provide client/server systems. It also follows EDS denials of reports that a lack of client/server wherewithal jeopardized its outsourcing job at Freeport-McMoRan, Inc., a New Orleans-based mining company (see story below).

Bolinder said his company did not specifically request a client/server approach. Smith chose EDS over both IBM's Integrated Systems Solutions Corp. subsidiary and Irving-based Kimberly Clark Computer Services, Inc. because "they made the best proposal," he said.

Bolinder would not confirm that the job is valued at $160 million. He said a number of variables make it difficult for him to state a fixed amount.

EDS takes over responsibility for all corporate data center activity, telecommunications and application development, an EDS spokesman said. Smith will continue to operate systems at its stores, each of which has an NCR Corp. Tower that drives programs for various operations.

EDS will transfer data communications from the leased lines that Smith now uses to EDS' own network. The data communications network ties Smith's headquarters with its three distribution centers and its stores.

Ned Cudney, who was second in charge of IS operations at Smith, was named vice president of systems and technology in charge of managing the EDS relationship.

Outsourcing switch at Freeport raises questions

BY MARK HALPER
CW STAFF

NEW ORLEANS — In the wake of Freeport-McMoRan, Inc.'s outsourcing split with Electronic Data Systems Corp., questions linger regarding how much the mining company is paying to sever the arrangement, and whether it will close deals under negotiation with IBM, Andersen Consulting and ComputerLand Corp.

Freeport and EDS recently agreed to part ways after they were unable to agree to a pared-down contract sought by Freeport.

Freeport had already renegotiated the original 10-year, $200 million deal once before, cutting the cost by 25% to 35% in early 1991, according to EDS.

Lost money

Analysts noted last week that the breakup represents one of outsourcing's classic traps: It is costing Freeport money to break the contract, though neither side will say how much.

"You have to negotiate some sort of departure fee," said Steve McLellan, a Los Angeles-based analyst at Merrill Lynch & Co.

Freeport must now negotiate the tricky process of switching its outsourcing business to IBM's Integrated Systems Solutions Corp. (ISSC), Andersen Consulting and ComputerLand. The three companies have agreed in principle to provide outsourcing services ranging from mainframe processing in Freeport's home office to client/server solutions at the company's Grasberg, Indonesia-based gold and copper mining operations.

Analysts pointed out that switching outsourcers is a delicate proposition that requires cooperation between the outgoing and incoming providers.

The transition calls for transferring software from EDS mainframes in Plano, Texas, to IBM mainframes in Lexington, Ky., Freeport Chief Information Officer Mike Arnold said.

The company's fertilizer business, corporatewide accounting, tax programs and human resource applications will continue to be mainframe-based, he said.

Neither Arnold nor officials from ISSC, Andersen Consulting or ComputerLand would elaborate on the points they are still ironing out.

Closing outsourcing deals can be a drawn-out process. For example, EDS took 16 months to sign a deal with Continental Airlines after publicly announcing the contract.

Half the cost

Terry Quinn, senior technology analyst at Kidder Peabody & Co. in New York, estimated that Freeport's pending contracts with IBM, Andersen Consulting and ComputerLand will cost half as much as what EDS had been charging.

Freeport, which was a $1.96 billion company when it first signed with EDS in 1988, had revenue of $1.6 billion in its last fiscal year.

Since the contract's inception, Freeport has sold many of its business units to concentrate on gas and mineral discoveries in the Gulf of Mexico and Indonesia.

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FDDI prices plunge toward affordability

IBM, 3Com lure users wary of the technology with announcements of lower cost fiber products

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — The price of 100M bit/sec. local-area networking nose-dived toward the vicinity of user budgets last week, when $1,300-and-up Fiber Distributed Data Interface (FDDI) products emerged from 3Com Corp and IBM at the Interop '92 Spring show.

The aggressively priced adapters and concentrators for both IBM Type 1 shielded twisted-pair copper wire and fiber cabling will likely move the high-speed LAN closer to the corporate masses. This is because more users may be able to justify FDDI's relatively high connection costs, which currently average $4,500 per port for connections to both of FDDI's counter-rotating rings, according to analysts.

The price issue has been compounded by users' uncertainty about whether their applications yet justify the technology and whether future higher speed switched LANs will leapfrog FDDI.

"I'm still trying to determine if the network is my bottleneck," said Kurt Muehlbauer, supervising analyst in the information systems department at Chicago-based utility Commonwealth Edison. He said one reason he attended Interop '92 Spring was to find an inexpensive tool for analyzing traffic loads on his 21 Ethernet segments "to determine if I even need to move to FDDI."

Indicators that bandwidth-hungry applications for FDDI are indeed imminent, however, include a *Computerworld* survey of more than 200 attendees at the Interop show last October, which tagged FDDI as users' premier interconnect deployment scheme for the next 18 months [CW, May 11].

Users cited such applications as graphics, computer-aided design and manufacturing and imaging as the forces driving them to explore FDDI.

For example, show attendee Doug Barnhart, a senior engineer at the University of Tennessee in Knoxville, is considering FDDI for an emerging medical imaging application that must traverse two sites 26 km apart. "FDDI is one of the few technologies that can handle those distances at those speeds," Barnhart noted.

Advocating FDDI to the desktop, 3Com last week rolled out a $1,300 Type 1 and a $1,900 fiber adapter card — both for Extended Industry Standard Architecture (EISA) bus computers — slated to ship in the fourth quarter. The cards attach to both FDDI rings.

These prices are nearing affordability for a data network manager at a large East Coast publishing company who asked not to be named. He cited $1,800 for each dual-fiber connection as the price point where "we would start putting FDDI on everyone's machine." He said he is uninterested in the copper alternative because of its future bandwidth limitations.

3Com designed the EISA cards with the scrambling technique incorporated in one of the formal standards committee proposals for FDDI over unshielded copper.

This will likely render 3Com adapters compatible with an official standard, expected near year's end, said George Prodan, 3Com's adapter product manager.

Signal scrambling is necessary for implementing 100M bit/sec. networking over unshielded copper in order to avoid the accumulation of electromagnetic emissions, said Prodan, who is also a member of the national FDDI standards committee.

Backbone-oriented IBM unveiled a more expansive, as well as more expensive, line that included Type 1 and fiber adapters and a Type 1/fiber FDDI concentrator, all supporting Micro Channel Architecture computers and slated to ship in September. The per-connection price of IBM's products is about $1,600 for copper and $2,100 for fiber for a single-attached adapter card in a high-end Personal System/2 that links to a dual-attached, 24-port concentrator.

While IBM and 3Com's moves were hailed by several observers as a big stride for FDDI, many users continue to push for lower costs.

"A PC is about $2,000, and an Ethernet adapter card for it costs between $100 and $200," Barnhart said. "When the cost ratio between our Sun workstations and the FDDI card is the same, FDDI will certainly be more attractive."

RBOCs cast low-cost wide-area network

CONTINUED FROM PAGE 1

Users oohed and aahed over sample frame-relay pricing offered by US West and Bell Atlantic Corp. US West filed a tariff in Nebraska earlier this month for 56K bit/sec. frame-relay service priced at $104.90 a month for a single permanent virtual circuit (PVC) and $57 per PVC for users of five PVCs, said Jerry Parrick, vice president of customer solutions.

Customers with more than five PVCs would default to flat-rate pricing, he added.

Several local carriers said their pricing would be in line with US West's. But no pricing was given for SMDS.

Bell Atlantic said its frame-relay service at T1 rates will range between $550 and $650 per month, with a onetime $1,000 installation charge per line.

"We anticipate that users could save $30,000 to $40,000 per month [compared with] leased T1 lines with this pricing scheme," if they are connecting between 10 and 12 sites, said John Seazholtz, Bell Atlantic's vice president of network technologies.

The pricing "seems awfully cheap," said Rich Harrington, a technical officer at the First National Bank of Chicago, who said local-area network interconnect is catapulting his firm into fast-packet evaluation.

"I thought it would be in the thousands of dollars per month," Harrington added.

Frame-relay standards are currently limited to PVC-type offerings, which means that users set predefined links with specific sites. SMDS, on the other hand, more closely resembles a switched public telephone network, where any member of the network can communicate on the fly with any other member.

All but nine states

The rollout plans are a big stride in the fast-packed evolution. However, nine states will not figure in the Bells' immediate plans: Iowa, Louisiana, Mississippi, Alabama, South Carolina, New Hampshire, Vermont and Maine.

An official at Sprint International said his company is prepared to offer the long-distance connections between Bell regions for both services when they become available — a key user concern surrounding the reach of telephone company fast-packet services.

However, AT&T and MCI Communications Corp. have made no statements about interconnectivity.

While the announcements fill many gaps, "we still need the whole picture," said Bill Everett, manager of telecommunications planning at Consolidated Rail Corp. in Philadelphia (see story page 6).

"We have to see that there is incentive to change from existing technologies," Everett explained.

Ralph Sandridge, network planner at Martin Marietta Corp., has been testing frame-relay service from an unnamed carrier for consolidating multiple networks onto one backbone. He said that he has "found frame relay to be fast compared with X.25."

Sandridge also said he is controlling the firm's migration to frame relay by restricting the initial protocols that can run across it while he determines congestion patterns.

Apple lets loose with networking barrage

BY JAMES DALY
CW STAFF

WASHINGTON, D.C. — Apple Computer, Inc. extended its reach into the corporate enterprise last week by rolling out additional links to the IBM, multiplatform and open systems world.

Topping the list of network products introduced at Interop '92 Spring last week were a Token Ring extension for Apple's Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity package and three products designed to address the Open Systems Interconnect (OSI) marketplace, including X.400 and Open Document Architecture.

Analysts said the additions are vital if Apple wants to increase its penetration in corporate and institutional environments. "If Apple wants to be a legit player in multivendor networks, it has to trot out some products," said Rick Villars, an analyst at International Data Corp., a research company based in Framingham, Mass.

Macintosh users have long cried out for Apple to backfill its connectivty options. Improved TCP/IP connectivity, for example, has long made the Top 10 list of requested items published by such key Apple user groups as MacIS.

"If Apple is going to start playing with the big boys, they've got to connect to everyone," said Rob McPhee, a development engineer at Wilmington, Del.-based Du Pont Co. who now links his Macintoshes into a TCP/IP network via public domain software.

Apple's MacTCP Token Ring Extension will allow Macintosh users to address an IBM host via TCP/IP or Token Ring networks. MacTCP's software system drivers and programming libraries provide transmission services for developers who want to create Macintosh applications that use TCP/IP networks. It is co-resident with AppleTalk protocols. The Token Ring Extension will be available late next month and will be bundled into Apple's MacTCP 1.1 products.

Apple's new OSI products — MacX.400, MacODA and MacOSI Transport — will enable users to send electronic mail from their Macintoshes to non-Macintosh, proprietary E-mail users. The complementary MacX.400 server, which sells for $5,000, can connect to public X.400 networks or X.400 backbones. The MacX.400 developer's kit will sell for $200.

Document interchange

MacODA is a software translator that uses the Open Document Architecture standard for document interchange between different applications and platforms, including documents that contain complex formatting and graphics. It is priced at $149.

When used in conjunction with the MacX.400 package, MacODA provides users with a seamless exchange to text and graphics in the PSI environment, Apple officials said.

MacOSI Transport enables Macintosh users to connect their Macintosh applications to OSI environments.

The MacOSI Transport Kit will sell for $200; a developer's kit will also cost $200.

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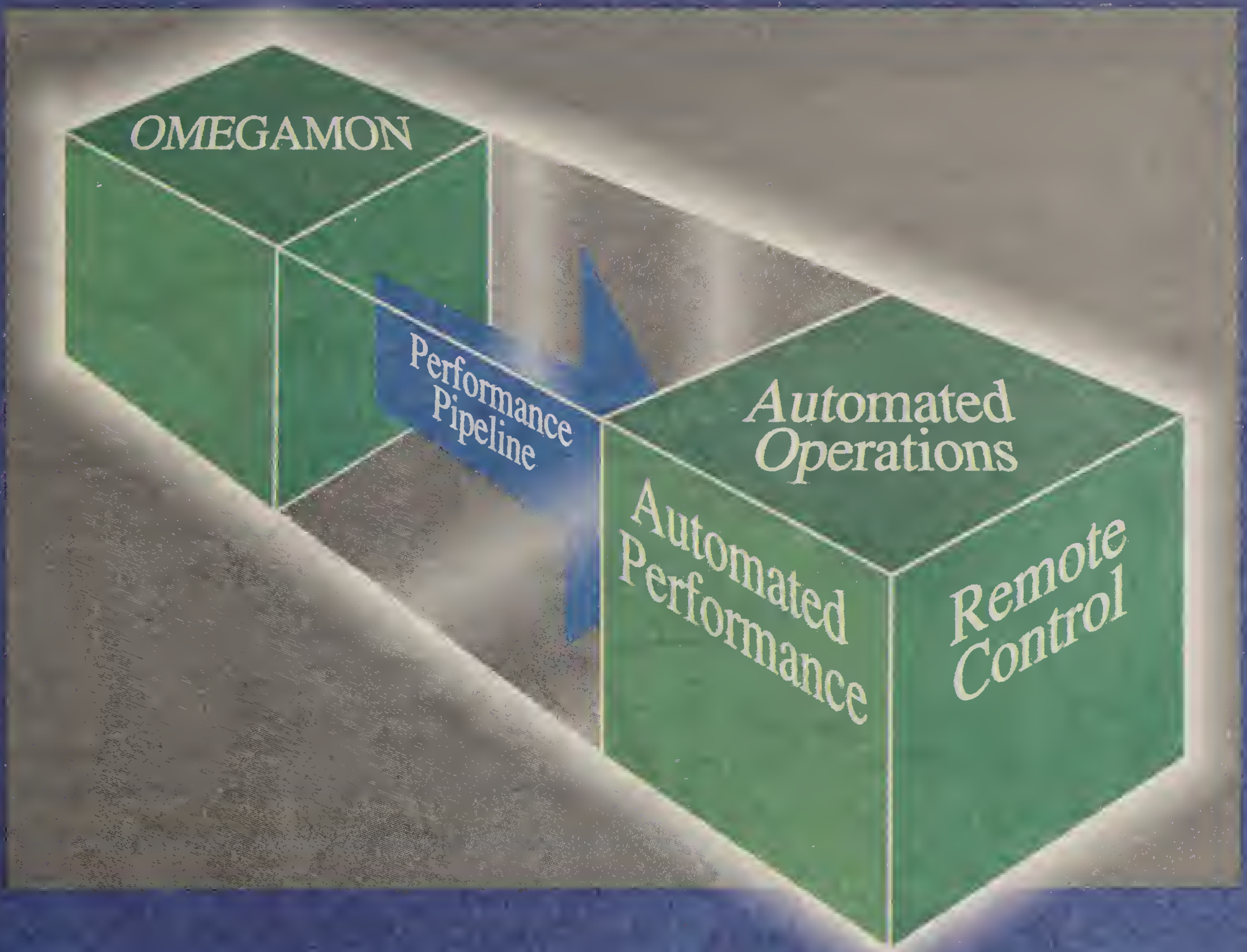

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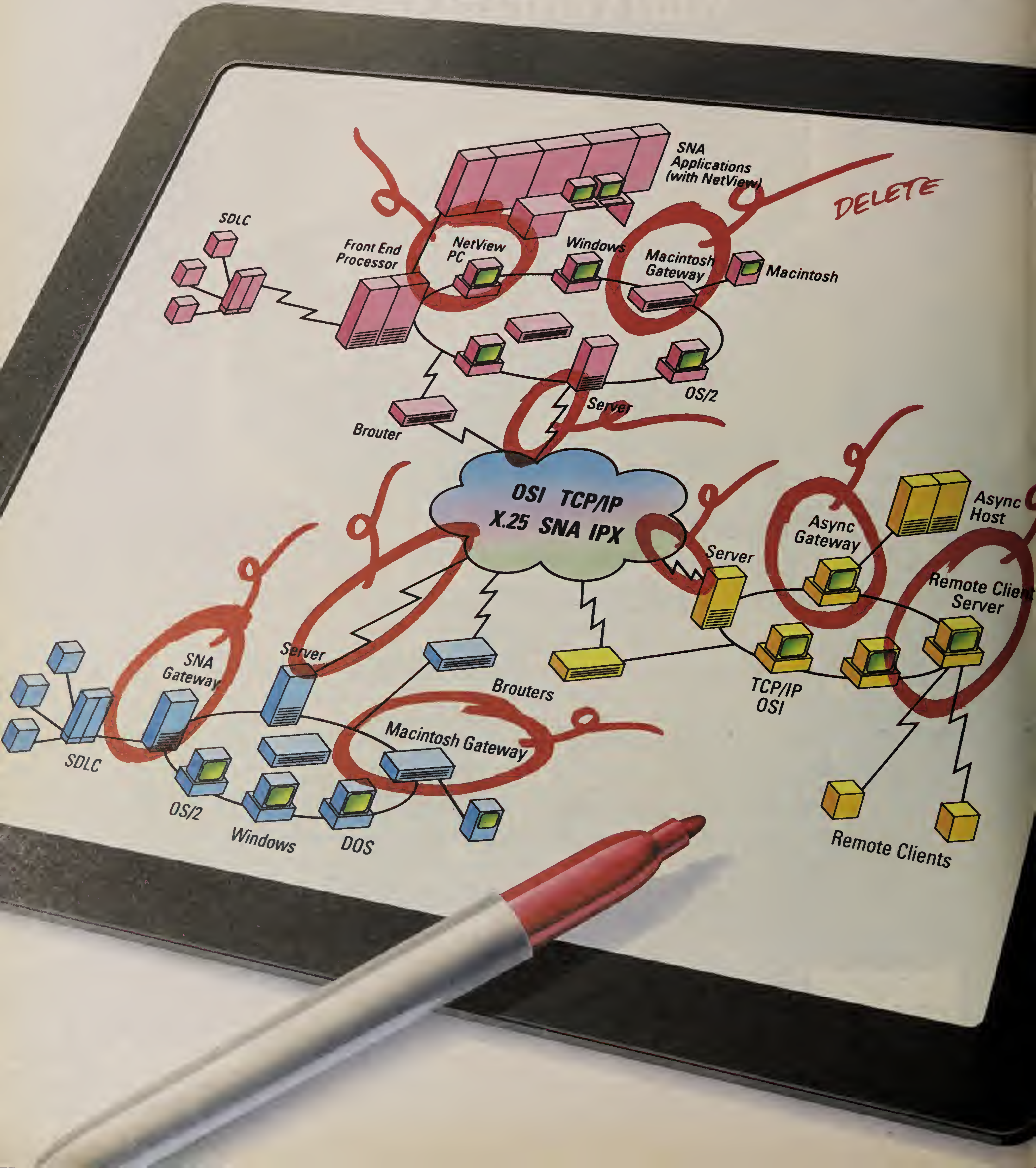

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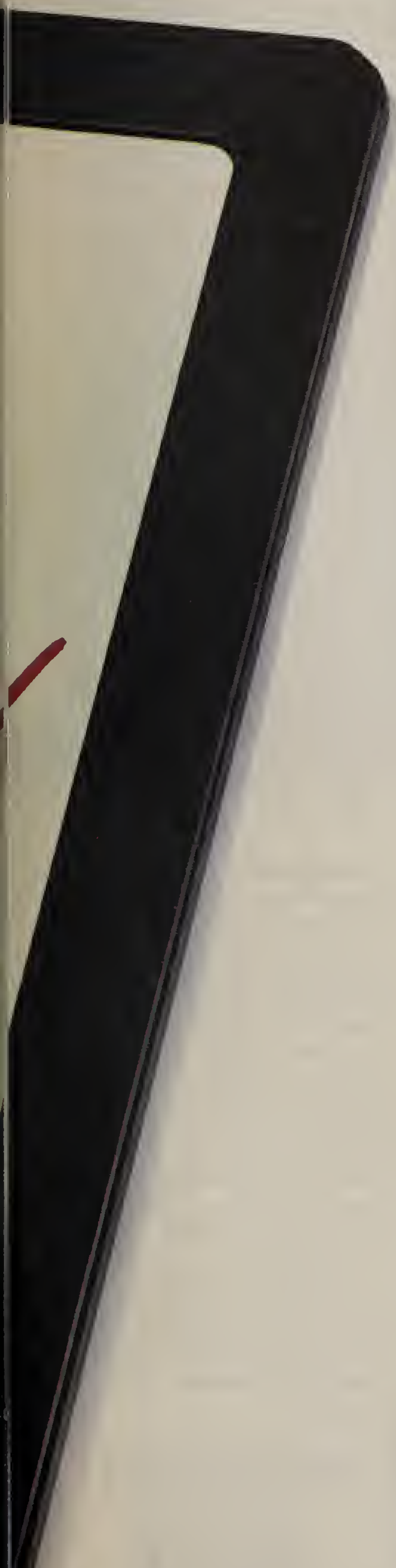

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CA outlines broad-based PC strategy

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — Computer Associates International, Inc. last week detailed its plans for a wave of personal computer-based software products and upgrades slated for fall delivery.

Chief among these is a mainframe-based electronic-mail system to connect clients on Microsoft Corp. Windows-based workstations with host computers using an X.400 link.

A Microsoft Windows New Technology tool kit for users is also in the works, according to Nancy Li, senior vice president of research and development. She did not provide details.

In addition, CA Chairman Charles Wang said the company will unveil a PC database strategy within two weeks of the expected June date for the Securities and Exchange Commission's approval of CA's bid to acquire Nantucket Corp.

The announcements were made at CA's Partnership Conference for 350 distributors, value-added resellers and other business partners.

CA also announced that it has acquired three more PC software packages.

Two of the new product acquisitions — Visual Report Writer from Working Set, Inc. and Realizer from Within Technologies, Inc. — are targeted at expanding the company's presence in the Windows application environment, while Purchase Order Module from Crystal Services, Inc. will add additional functionality to CA's CA-ACCPAC Plus Accounting series PC software.

Analysts critical

Despite a blitz of new products, not everyone is impressed with CA's PC software direction.

"There's no long-term view here at all," said Richard Finkelstein, president of Performance Computing, Inc., a Chicago-based database consulting firm.

Analysts said CA is working hard to build a presence in the PC software market but still fails to demonstrate a coherent strategy.

Realizer "fits in nicely with CA's emerging product set for CASE tools," said Andrew Mahon, a senior analyst at New Science Associates, Inc., a Southport, Conn.-based market research firm.

"People don't have enough sense of what products we have. We need to work on that," Wang said. "I promise you, you will see a lot more in the year to come."

"They've done more work in PC software in the last year than they've done in the two years before this," Finkelstein said.

Three times over

According to CA Senior Vice President Sanjay Kumar, the company tripled its North American microcomputer products field staff when it reorganized its operations last month.

Then there is the continuing stream of software acquisitions. Visual Report Writer is a report generation program for Windows 3.1 that provides access to SQL, CA's CA-dBFast, Borland International, Inc.'s dBase and Nantucket's Clipper dBase/xBase databases.

Realizer is a graphical Basic development environment tool that competes with Microsoft's Visual Basic, but the product is said to lack necessary third-party support.

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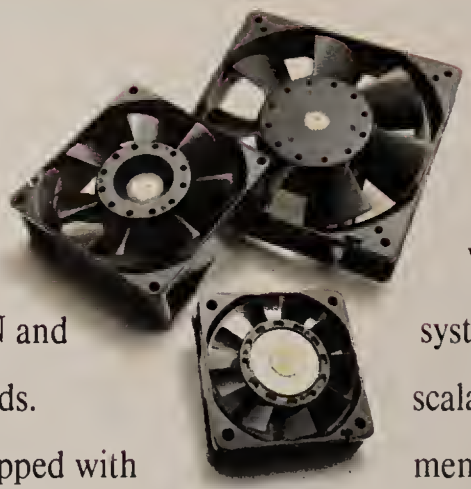

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New-generation screens are a tough nut to crack

IBM Japan/Toshiba joint venture well-supported, but cost, materials and market interest questions remain

BY LORI VALIGRA
IDG NEWS SERVICE

Standing in stark contrast to the other major draw in the Western Japanese city of Himeji — an ancient castle known to many westerners from the movie "Shogun" — flat display maker Display Technologies, Inc. (DTI) is pushing the edge of manufacturing technology.

DTI's product, a thin-film transistor (TFT) LCD, is so difficult to manufacture that even a tiny speck of dust can humble a multimillion-dollar production line. Such flaws could render 60% of the 10,000 screens made in a month suitable for only the junk pile.

Added to that are high materials costs, uncertain supply lines, a dearth of specialized capital equipment and a market that is skeptical of the practicality of the new, high-priced screens.

Experienced parents

Ironically, this is no run-of-the-mill start-up. IBM Japan Ltd. and Toshiba Corp., one of the world's largest producers of laptop and notebook computers, have invested a combined $253.8 million in the 50/50 joint venture to date. Some $123 million went toward state-of-the-art manufacturing equipment.

DTI was established in November 1989 and rolled its first products off the line in October 1991, two months behind schedule. The 304,000 sq ft DTI factory, leased from Toshiba, includes 107,500 sq ft of clean rooms.

The company has strong management backing, with five board members from each parent company, including Nobuo Mii, a key technology driver for IBM Japan's personal computer business and now a vice president at parent IBM in the U.S. Each company also contributed 20 engineers, 15% of whom have a semiconductor background.

Added to that is the advantage of having two ready-made major customers: IBM Japan and Toshiba, which will share all the production equally during the seven-year life of the joint-venture agreement.

But all these seemingly inherent advantages leave many questions unanswered about the TFT LCD market, which Toshiba estimates will comprise half of the $7.7 billion demand for LCDs in 1995. For example, the factory can completely fill demand from its parents, two of the biggest players in the personal computer market, for five to six years, according to DTI's senior executive vice president, Norio Okumura. He added that IBM has no plans to make the screens in the U.S.

Juan Thomassie

Though Okumura and other DTI executives envision a broad market for TFT screens — known for their crisp color images, light weight and relatively low power consumption — the costs of the current screens are too high to make them attractive in price-sensitive consumer products, such as flat televisions or navigation screens for automobiles.

The cheapest screen to make now is 10.4 inches, and it costs about $2,308 to produce, according to DTI President Koichi Ogura. That is more than the price of a book-size computer with a conventional LCD; a color TFT LCD more than doubles the price of a portable computer.

Rare goods

Thirty percent of the screen's cost is for materials, such as the color filters and thin glass needed for the screens, both of which have limited sources. In fact, the glass is only available from Corning, Inc. in the U.S.

Ogura said some outside estimates figure the cost per screen could come down to $385 by 1996. But any price premium could hamper sales, according to one market watcher in Japan. Cutting the price is a dual-edged sword: The U.S. already has slapped punitive dumping tariffs on Japanese makers of TFT LCDs.

Still, without price reductions, the screens will likely remain niche products at best. "There is a serious cost problem now. The 10.4-in. screens are basically limited to office automation applications," Ogura said.

Low yields

There are several ways to trim costs: Increase yields, decrease component costs and boost volume. The factory will soon make 10,000 panels per month, half its total capacity. "Yields are not too high now. And there is a poor infrastructure industry for parts for displays, so there are problems with availability. High materials costs remain a very severe problem," Ogura said.

Raising yields is a continual challenge. The yield the first month of production was 8% — lower than expected, especially when considering the 80% target in two to three years. "Yields are about 40% now and are growing rapidly," Ogura said. "To increase yields we need new technology. We need to change the process many times." Even today's state-of-the-art capital equipment was not made to cope with the tolerances needed for TFT displays.

But that equipment is forthcoming because most major Japanese electronics companies are already working on TFT LCDs. Among DTI's competitors in 10.4-in. TFT LCDs are Sharp Corp., NEC Corp., Hitachi Ltd., Mitsubishi Corp., Sanyo Electric Co. and Casio Computer, Inc. — all with 640- by 480-pixel Video Graphics Array screens.

Benefits of active-matrix TFT displays

Lightweight, needing little power and sporting brilliant colors, active-matrix, TFT LCDs have become the hottest display technology among Japan's major electronics companies.

The aim is to keep putting them into ever-lighter portable computers and to use them for televisions, large-size informational wall hangings, medical equipment and navigational devices for automobiles, airplanes and ships.

Active-matrix LCDs stemmed from work done in the early 1970s at Westinghouse Electric Corp. and RCA Corp. The display's technology is based on organic liquid-crystal molecules that can be aligned using an electric field. Their alignment determines how much polarized light can pass through the screen.

To create an image, light from a fluorescent bulb passes through a polarizer and onto a TFT liquid-crystal panel. The liquid-crystal panel contains TFTs etched onto a plate of glass or amorphous silicon. Those transistors control voltages that can actually make the liquid-crystal molecules twist the polarized light to create lighter or darker subpixels. The light then passes through a color filter, with each subpixel assigned a red, green or blue filter.

OLD-FASHIONED CRT displays still hold the record in response time — less than 10 msecs.

It takes three subpixels to make one pixel of red, green or blue on the display.

The screen from DTI, an IBM Japan/Toshiba joint venture, has more than 300,000 pixels displaying 512 colors. The 640- by 480-pixel display is VGA-compatible.

Compared with conventional simple-matrix displays, active-matrix screens have a switch at every cross point (pixel), which is equivalent to 1 million switches, far more than the amount used in simple-matrix displays.

Active-matrix TFT technology is much faster than conventional super-twist pneumatic (STN) displays, which have 100 to 150 msec. response times, compared with 30 to 50 msec. for TFT.

"Many people use Windows now. With STN displays it is difficult to chase a mouse across the screen. But this is not a problem with TFT," said Hidenori Akiyoshi, director of engineering at DTI.

Perhaps ironically, old-fashioned CRT displays still hold the speed record in response time — less than 10 msec.

LORI VALIGRA

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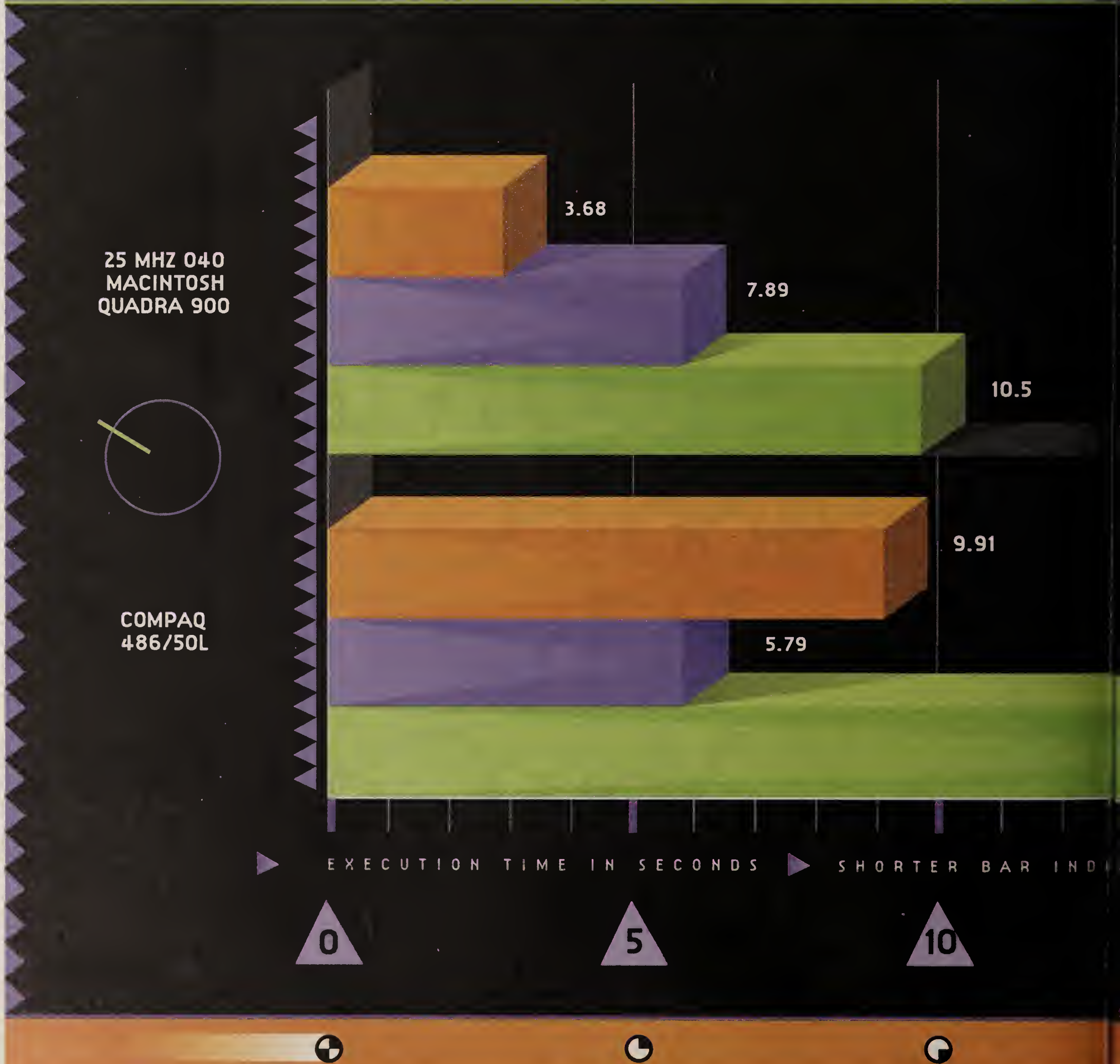

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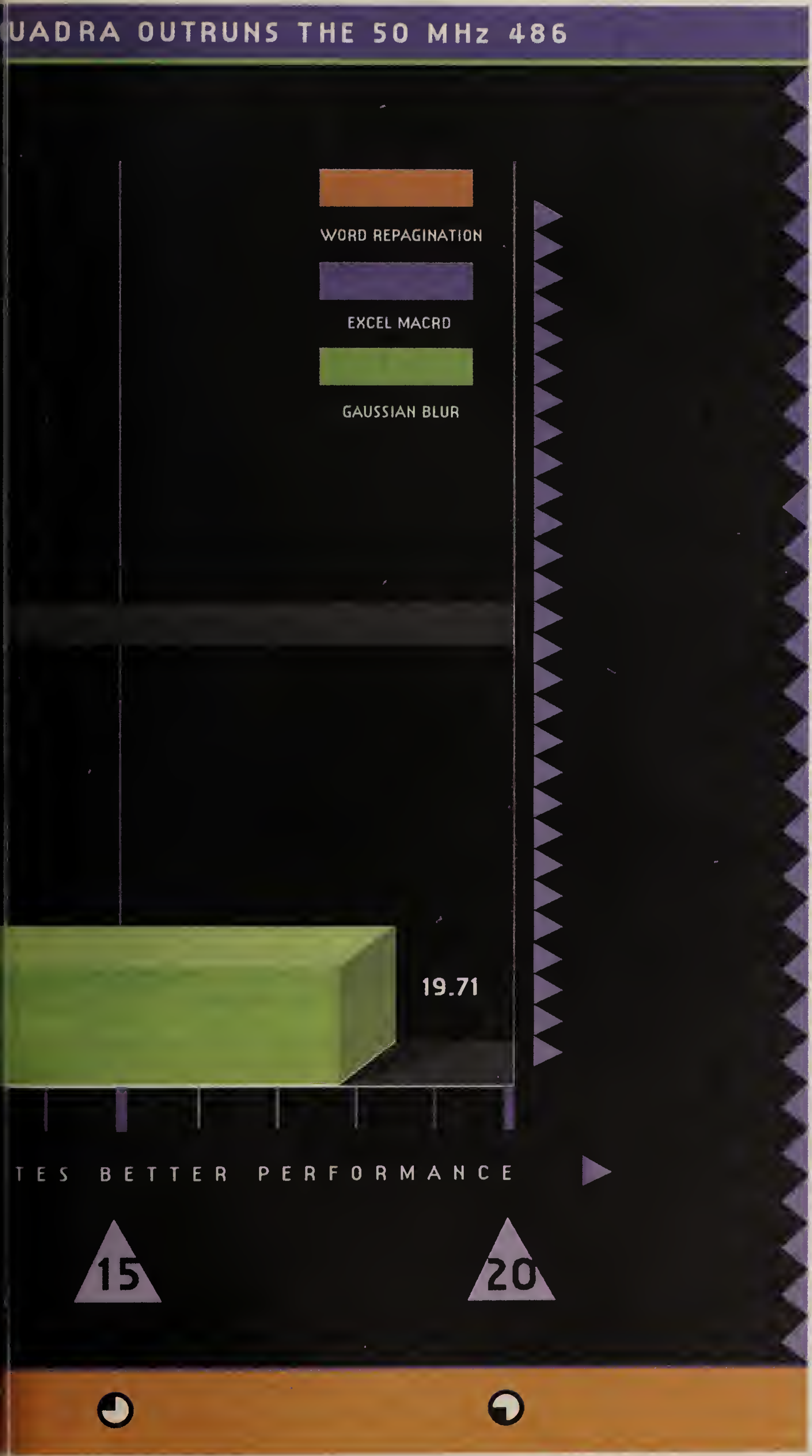

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No surprise, really. Macintosh and its graphical user interface were designed from the start around the 68000's true 32-bit architecture. Naturally, it outperforms a computer powered by an extended 8-bit architecture running a character-based operating system with a tacked-on GUI.

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EDITORIAL

Federal case

"A billion here, a billion there, and pretty soon you're talking about real money."
Illinois Sen. Everett M. Dirksen
(1896-1969)

When you count your blessings, include the fact that you're not in federal government IS. Cost overruns are just one of the balloons the U.S. General Accounting Office (GAO) has been poking pins at in the average of one report a week it issues criticizing federal agencies for their handling of IS.

The good news is that the government is making some moves to get its IS act together. Our profile of the Patent Office's Tom Giammo [CW, April 6] shows how innovative managers are breaking the mold and getting things done. The bad news is that the federal government is swimming against the tide of years of entrenched bureaucracy. No one has all the answers, but a few threads run through most of the examples.

Grand design — Federal IS operations have taken a lot of heat over the megaproject strategies they pursued during the '70s and '80s. That thinking led to fiascoes like the Federal Aviation Administration systems project that was out of date before it was even awarded and a Navy programming project that is already 10 years behind schedule. Grand design is not a bad concept, but applying it to hardware and software design is like planning what clothes you're going to wear in 1995. Everything's going to change.

Long procurement cycles — Federal purchasing is so hampered by cover-your-rear thinking that by the time bidders deliver their goods, the specifications are out of date. The Air Force's Desktop III spec ran over 1,000 pages and covered PC technology that would be obsolete in six months. The obvious solution is to rewrite procurements to emphasize goals rather than specific technologies. The Air Force tried that with Desktop IV only to later scrap the award because so many bidders protested.

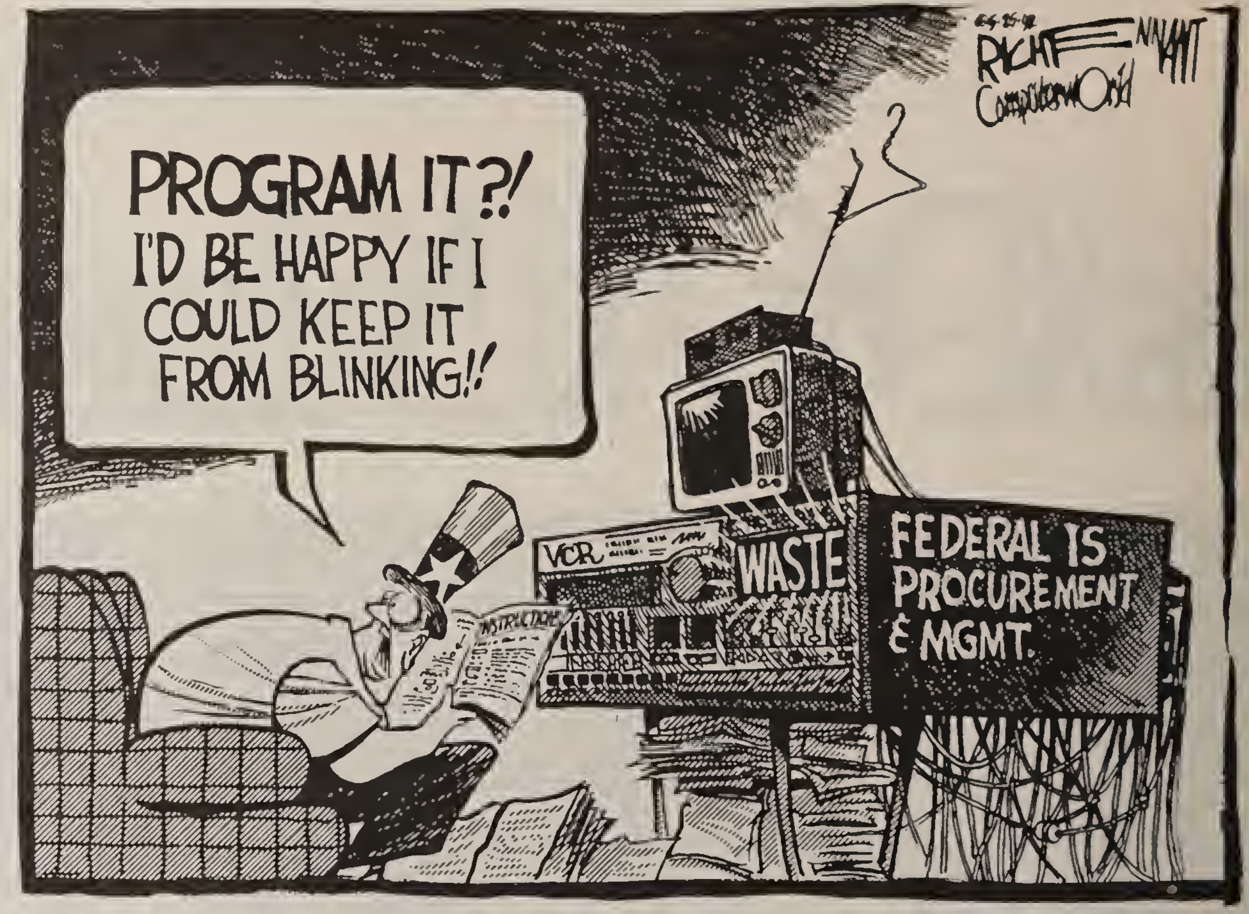
Complicated appeals — The loser in a bid award can protest to multiple bodies, including the General Service Administration, the GAO and the courts. Because so many losers do appeal, the bidding process can stretch on interminably. An appeals process is necessary, but not one that renders contract specifications obsolete.

Lack of skills — Good employees are hard to find, especially in Washington, D.C., where civil service salaries and turnover keeps things in a state of flux. The Department of Commerce's "Trail Boss" program is showing promise for putting projects under the control of skilled technology evangelists. It should be expanded.

Sen. Dirksen's wry quote expresses what's been wrong with Washington for a long time. It would be good to see federal IS departments leading the move to fix it.

Paul Gillin

Paul Gillin, Executive editor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LETTERS TO THE EDITOR

Victimized by failing PC clone syndrome

The article "OS updates shut down some clones" [CW, May 4] was of special interest to me because I have been anxiously awaiting an article like that for the past few years.

I work in a department that uses SCO Xenix/386 running on various makes of 386-based PCs. We quite often run into cases where a PC will fail when running Xenix — with solid, repeatable symptoms — but no DOS-based test can find any faults.

I have tried calling diagnostic software companies to ask if they have any tests that run in 386 mode but have yet to find anyone who even understands why I might need one. I called Intel and The Santa Cruz Operation's support offices a few times, but they weren't any help, either.

The only hope I had was that one day when Windows and OS/2 started making fuller use of 386 mode and reaching a wide enough audience, then they would start running into the same types of PC faults that Xenix was finding.

I guess that day has finally come.

Leroy Erickson
Unisys Corp.
St. Paul, Minn.

Offshore success

"Kiss U.S. coders good-bye" [CW, April 6] was a timely article describing the kind of international alliances that International Business Systems, Inc. has been successful with. As usual, the dissenters base their opinions on extremes rather than reality. Capable developers in most countries speak good English, and there is no reason to assume that no face-to-face contact ever takes place just because coding is performed offshore. In many cases, the other phases of the product life cycle are performed on site.

The area for savings can certainly surpass 15% and may surpass 25% when price, quality and productivity are combined. I appreciated the opinions that were positive and forward-thinking on this subject. To one and all I say, not only can it work successfully, but it already is working successfully!

Ed Zimmerman
International Business Systems, Inc.
Englewood Cliffs, N.J.

All U.S. workers do not look the same

I was disturbed by the tone of J. Benedetti's letter [CW, April 27] replying to Edward Yourdon's "Kiss U.S. coders good-bye." In citing one example of a bad non-American programmer, he wrote, "American business is for American workers." Will he trash my resume because I have a non-American name?

In another letter in the same issue, James Rotter talked of the problems that language and cultural differences present. The market will take care of language. Cultural differences? Is an appreciation of NFL games a prerequisite for C programming?

I am one of the millions of immigrants who admire the opportunities, tolerance and pluralism of American society. Let's not let a bad economy spoil it.

Jagadisan Shivakumar
Software developer/manager
Huntsville, Ala.

Same yardstick

Gary T. Marx ["Let's eavesdrop on managers," CW, April 20] has a novel concept: that managers should be held accountable for their time and (un)productivity. In an age where the annual earnings of some executives outpace the lifetime earnings of their employees, Marx's idea suggests that all workers be measured by the same productivity yardstick.

Without closer scrutiny of senior managers, how is it that corporations continue to justify outrageous compensation of CEOs in the face of mounting corporate losses?

Marx writes, "Imagine what could be uncovered if a full audio and visual record of all the job-relevant behavior of senior executives and managers was available." The next thing you know, stockholders in droves will start demanding that their CEOs be replaced with the company's star data entry clerk!

Lynne Gregg
Seattle

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Wiretap proposal isn't radical

WILLIAM S. SESSIONS

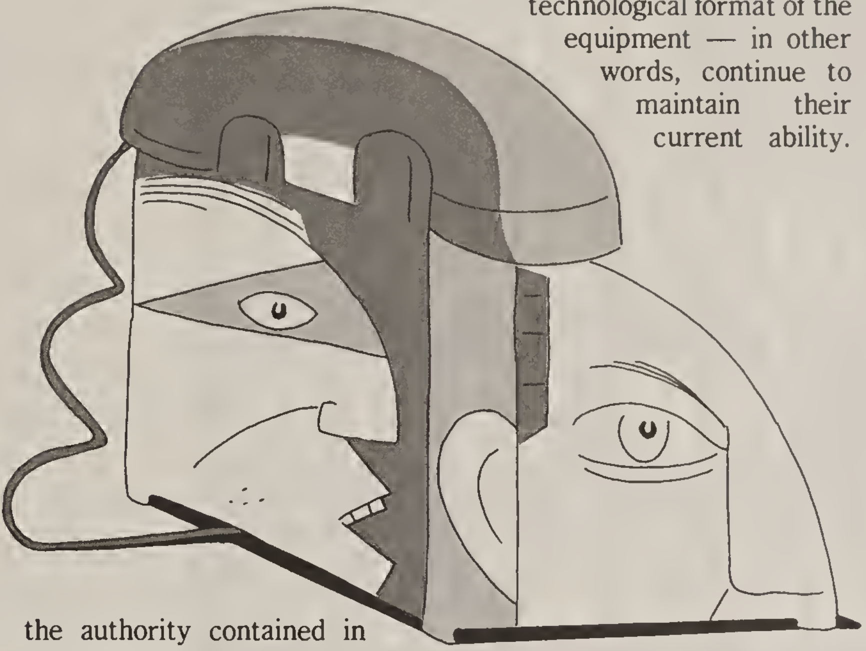
In the May 11 issue of *Computerworld,* Marc Rotenberg, Washington office director of Computer Professionals for Social Responsibility, stated that if the FBI has its way, then nothing traveling across phone lines will be safe.

Rotenberg was referring to a proposal by the U.S. Department of Justice on behalf of law enforcement at all levels to ensure that telephone technological developments accommodate law enforcement needs. I would like to answer some of his points, several of which are inaccurate.

Last resort

First, in 1968, Congress carefully considered and passed the Omnibus Crime Control and Safe Streets Act. This statute laid out exacting and demanding procedures pursuant to which law enforcement can apply to a court for authorization to conduct electronic surveillance.

Rotenberg correctly recognizes that this is an investigative technique of last resort, and it has become invaluable in combating serious crime and saving lives. Nothing that has been proposed would expand or change the authority contained in that 1968 law.



M. E. Cohen

Second, the 1968 act requires telephone companies to assist law enforcement in implementing wiretaps. What has been proposed is legislation that clarifies the duties of the telephone service providers in responding to court orders.

This proposal would ensure that all telephone service providers have an equal ability to facilitate a wiretap in response to a court order, regardless of the technological format of the equipment — in other words, continue to maintain their current ability. It would not authorize remote or "one-stop shopping" wiretapping.

Third, no one in law enforcement has proposed that telephone systems be designed with the ability to wiretap as the "design goal of first consideration," thus risking the reliability of the systems. To the contrary, law enforcement is asking industry to craft a solution. Industry is in the best position to ensure reliability and maximize security.

Secure and private

We believe the new systems will be far more secure from illegal interception than those predominately used today, and we agree that privacy should be protected from illegal intrusion.

Finally, the assertions that FBI employees were recently arrested for selling confidential information and that automation equipment containing sensitive data has been lost are simply incorrect. What has been proposed is very simple. Law enforcement merely wants the telephone service providers to be able to provide the electronic signals going to and from a particular telephone, when served with a court order to do so.

Congress authorized that in 1968, and I believe that status quo should be maintained. If it is not, the cost to the safety of the public will be great.

Sessions is director of the Federal Bureau of Investigation.

Users have no choice but to live in the past

PATRICIA KEEFE

This is starting to look like the make-do decade. In recent conversations, various industry players have pointed out what they see as a glaring problem: a too-heavy reliance on old technology to solve today's problems. Of course, what these folks usually fail to take into account is that given what vendors are delivering, users often don't have a whole lot of choice.

Think about it. We're not replacing Basic; we're embracing Visual Basic. We're not migrating to OSI, the seven-layer Open Systems Interconnect model. Instead, we've fallen back (with a vengeance) on what was supposed to be the stop-gap measure, TCP/IP.

Remember thick, clunky and costly Ethernet cabling? Many have swapped it out for unshielded twisted-pair cabling. That means we are using 100-year-old telephone wire to connect our high-tech desktops — but hey, it's cheap.

One of the ironies here is while two of the biggest Ethernet players weren't thrilled to see its return, unshielded twisted pair helped Ethernet regain its balance after a serious threat from Token Ring.

The perennial favorite has to be Unix. It's been around for some 20-odd years, and its fortunes often resemble the ebb and flow of the tides. Has any technology been recycled more? Had more covers? I think not. And heeding the latest cycle of user interest in Unix, we now have the two so-called leading-edge micro operating systems busting their chops to be more Unix-like.

> WE ARE USING 100-year-old telephone wire to connect our high-tech desktops — but hey, it's cheap.

Maybe sticking with old and familiar technology isn't a totally bad idea. As Ann Landers would say, "If it ain't broke, don't fix it." But for many users, the reasons they employ older technology have nothing to do with taking 'ole Ann's advice. In part, their decisions are based on practicality: This is a tough economy, and corporate downsizing is rampant. There is another — maybe even a greater — factor at work, however, and that's the snail's pace of delivery in many technology sectors.

IS shops can't grind to a halt while they wait for the next rev in technology to come along and solve their problems. In some cases, most notably OSI and FDDI, the standards process has dragged on so long that they can't wait any longer. They have businesses to run and problems that should have been solved yesterday.

Technological conservatism

Still, some vendors seem to be darkly hinting that if users do not support efforts to advance technology, then perhaps the vendors will no longer invest money in those advances. For example, at the November Forrester Research Technology Management Forum, an obviously irritated Ellen Hancock, who now heads up IBM's exiled Communications Division in London, made it clear that IBM isn't getting the reutrn on investment it expected from its OSI investment.

Acknowledging that IBM was caught off guard by TCP/IP's sales momentum, she urged users to show their commitment to OSI by opening their wallets.

According to Janet Hyland, Forrester's director of network strategy research, IBM isn't the only vendor waving the retreat flag on OSI. DEC and NCR are among those who have "really started to retrench from that strategy and back off development efforts," she says.

It's hard to blame the users, though — especially if the technology they are being asked to buy isn't finished or the vendor community can't articulate a relevant use for it.

Take multimedia. You *can* do it today. It's just that beyond help desks, training and on-line consumer guides, the Fortune 1,000 seems hard-pressed to come up with a business use for it.

Of course, achieving sophistication takes time and money, but vendors too often shoot themselves and technologies in the foot. When they aren't backing out of consortiums created to keep the U.S. on the leading edge of technology, they are forming technology alliances purely out of competitive spite or fear. The result is often redundant and conflicting standards work, followed by an unceremonious dissolution or withering of resolve on the part of the alliance.

It's all enough to make you cling to the tried and true. And cling users will, unless vendors are able to stop squabbling, Japan bashing and futzing around long enough to produce workable and useful technological advances.

Keefe is *Computerworld*'s assistant news editor.

Paying again and again for virus protection is enough to make you ill.

Frankly, paying anything at all is pretty nauseating.

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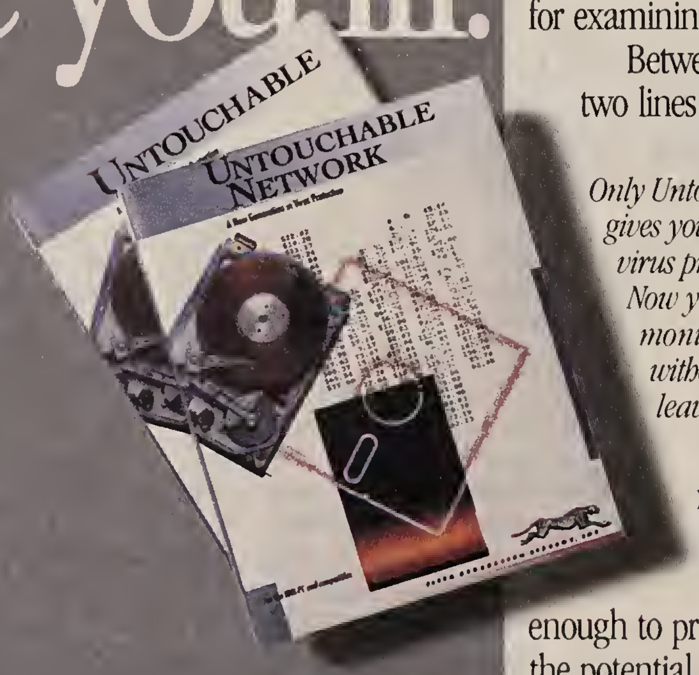

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FIFTH GENERATION SYSTEMS, INC

Detroit Edison plans the following:

- Will spend nearly $1 million to purchase 367 GridPads from Grid Systems.
- Will roll out to 267 line crews and 100 supervisors and administrative personnel; plans to complete rollout by September 1992.
- Will track tree-trimming efforts via computer, replacing cumbersome paper forms. Information will be based on PCs, in addition to a mainframe setup already in place.
- Will save $1.6 million because of increased efficiency in the first year alone.

Utility to save $1.6M with pen computing plan

Tree-trimming crews to run more efficiently

BY MICHAEL FITZGERALD
CW STAFF

DETROIT — Trees pushed Detroit Edison Co. to buy pen computers.

The utility pumps electricity to 1.9 million customers spread out over 7,600 square miles of Michigan. Many of those miles have hordes of trees with limbs that, left untrimmed, can fall and hit power lines.

Detroit Edison wanted to better manage its 267 crews of tree trimmers, and, after investigating the alternatives, decided pen computers offered the company a way to do it. It recently purchased 367 GridPads from Grid Systems Corp. and estimated it will save $1.6 million — more than the purchase cost — in the first year of use.

Detroit Edison's pen project presents an archetype for what pen-based computing observers have said will characterize early adopters of these types of systems: Its workers are mobile, previously unautomated and intensive users of forms.

"Our previous system used paper for everything," said John Caretti, assistant forestry specialist at Detroit Edison's line clearance central staff.

A pen system "lets us manage information better because it lets us track all the days we worked on trees, which crew did it, the growth rate of trees [and] which crews worked where. So we know a lot more about what we're getting into when we go into an area."

Caretti said this information was previously tracked by paper, "but the reporting was a lot more cumbersome." He said moving to the GridPads lets Detroit Edison be more flexible and much more responsive than it was before: The utility used to feed data into a mainframe, which churned out massive reports.

Fast response

Now, a personal computer-based database will also get the tree-trimming information, allowing much quicker turnaround on specific requests. Detroit Edison developed its application in-house, using Nantucket Corp.'s Clipper 5.0 and Fremont, Calif.-based R2Z, Inc.'s PadBase+ development tools.

Detroit Edison said it expects to save some $750,000 simply by improving the efficiency of its foremen through reduced paperwork.

The pen-based system has also condensed payment to contractors — Detroit Edison contracts its tree-trimming needs to independent companies — from 35 to 45 days to less than four days. Detroit Edison said it expects to save $900,000 from contractors removing a 4% fee they charge Edison to cover floating loan costs.

Caretti said GridPads were chosen because the other pen-based systems that Detroit Edison evaluated used an Intel Corp. 80386SX-class processor, which offered only four to six hours of battery life.

Caretti said the 80C86-compatible GridPad gets eight hours of battery life, which is essential because the crews spend their day out in the woods, away from their trucks. When the workday lasts longer than the battery, employees use an adaptor that plugs into their trucks' cigarette lighter.

Detroit Edison is purchasing a dozen Grid desktop PCs based on Intel's 20-MHz I486SX chip, with 120M- or 200M-byte hard disks built in and an external flash-card reader. These PCs will be used to manage the flow of tree-trimming information from the GridPads, and they will be used to send the data to a central mainframe and to tailor custom reports.

Compaq, IBM bank on service

Firms offer new support plans; users debate whether extra help is needed

BY CAROL HILDEBRAND
CW STAFF

Compaq Computer Corp. and IBM cannot beat the clone makers at their own price points, but the two hardware giants are aiming to come close. Moreover, they are banking on something new to entice users to pay a 5% to 10% premium: support from the vendor.

Some of IBM's corporate users, however, said they see IBM's new HelpWare program as more of an aid for home users or small businesses rather than a tool for the corporate market.

"HelpWare? I don't understand that one. To me, it adds a lot more fat and overhead than it would be worth," said Charles Darnell, chief information officer at Conyers, Ga.-based Lithonia Lighting, a division of National Service Industries, Inc.

Darnell said he could see it being more of an attraction for users with less resources at their disposal.

No need for frills

Jim Lough, a supervisor at the user help center at Kemper Insurance Co., agreed, saying that for him, IBM's support really did not need pumping up.

"We haven't really taken advantage of it," Lough said, adding that his company did not have a problem with IBM's service and support in the first place. "In fact, that's one of the reasons we stuck with them — the technical expertise they all have."

For Compaq users, any support at all is a step forward. Charline Avey, network administrator for the engineering department at the Indianapolis Water Co., said she was quite impressed with her encounter with Compaq's technical support.

Avey had called Compaq looking for a part that would help her add a disk array to her machine, which she wanted to use as a network server. The part was not yet available, she said, but Compaq made her one and sent it to her within a week.

Now, "I'll call their 800 number rather than the local representative whenever I have a question on new stuff," she said. "I was really impressed."

Both companies' restructurings in the past year have resulted in strong new emphasis on phone-in support, an area in which fast-growing personal computer manufacturers such as Dell Computer Corp. have built a strong reputation.

Previously, the two primarily relied on their network of dealers to provide support for their machines. Until March of last year, Compaq did not even have a number at which users could contact the firm's Houston-based headquarters.

Since then, the company's new focus has resulted in a technical support center that currently numbers about 100 people, a figure that Gus Tolias, vice president of service and support at Compaq, said he could see increasing by 50% in the next six months.

"The key is to make sure that service and support are more accessible," he said. "Some of our capabilities are well-kept secrets. We need to make ourself more visible."

The company announced the CompaqCare support program this month as part of that effort, Tolias said. Highlights of the

Continued on page 36

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BOARD WATCH

Chris Lindquist

Catty chatting

The bombast and rhetoric about Windows vs. OS/2 have been flying hot and heavy on the bulletin boards — so hot on some that the sysops and moderators have banned such discussions. As a result, the number of cheap shots has diminished. And many users seem too busy getting their freshly unwrapped software running to be on the offensive.

But while some IS departments are still sitting out the storm, lots of users on both sides of the fence seem to think the war is already over. Just who won depends on whom you ask.

■

Discontent with IBM's effort on OS/2 2.0's behalf continues. On Usenet, a terse message calling for the firing of the IBM marketing manager for OS/2 2.0 was greeted with a response of "You mean there is one?"

■

One user excused the lack of marketing in a manner IBM would probably rather not hear. His claim was that OS/2 2.0 simply is not ready for mass-market users yet and that IBM is intentionally waiting a while for the media blitz.

"If IBM mass marketed OS/2 [2.0] in its current form, they would be killing their reputation."

■

Predictions on the boards are that the June/July ship of an OS/2 2.0 bug fix should solve most of the problems being encountered by users. Common bugs reported included lack of support for a variety of SCSI and video controllers and interface problems with the Workplace Shell.

■

Want to see the list of OS/2 2.0 developers? Type Control-Shift-Alt-o.

■

Oh, and another bulletin board user who claimed to have a relative working in IBM research and development said that nearly all of the OS/2 developers are currently performing technical support. Why? They're fighting with a 7,000 phone call backlog.

■

Meanwhile, Windows 3.1 users are running into some problems of their own. Again, getting driver updates, such as those for mice and video adapters, can be a slow process.

■

Some heavy communications users are reporting nagging difficulties with Windows 3.1's communications support. Seems that despite the improvements made since 3.0, users still lose data and have trouble establishing high-speed connections.

And a developer for a popular communications package told me that while 3.1 is better for communications, if you're serious about needing to multitask while attached to remote systems at high speed, go for OS/2 2.0.

One possible solution being reported, if you must use Windows 3.1, is to buy Berkeley, Calif.-based Bio-Engineering Research Laboratories' Turbocom communications driver to replace the one shipped with Windows.

Lindquist is a *Computerworld* staff writer.

Author throws curve at virus hunters

BY JAMES DALY
CW STAFF

There is a pernicious and difficult new hazard to detect in the world of computer viruses that not only has sent makers of virus alert packages scrambling but may forever change the nature of the detection game.

The so-called Mutation Engine is a novel kind of threat that is actually not a virus, but an object module linked to a piece of viral code.

The Mutation Engine first appeared on bulletin boards a few months ago. Experts said they believe it originated in Eastern Europe and is possibly the work of the same Bulgarian virus creator responsible for creating the Dark Avenger virus. Its appearance varies according to the virus to which it is attached. What makes it particularly ominous, experts said, is the sophisticated way it avoids discovery.

Before a virus can become active it needs to decrypt itself. Ordinarily the code used for this remains constant, allowing the use of standard byte-matching detection techniques. The Mutation Engine, however, uses a special algorithm to generate a different decryption routine each time.

"The result is that no three bytes remain constant from one sample to the next," said Igor Grebert, a senior programmer at McAfee Associates, a developer of antiviral software in Santa Clara, Calif.

Tough to find

In the past, viruses such as Jerusalem or Michelangelo had distinct, single identities that made them easy to detect and control. Not so with the Mutation Engine. Typical virus detection techniques are useless on such mutating viruses.

"Most antiviral software looks for these virus signatures, but there might be a multitude of signatures attached to this engine, and an antivirus application won't know what to look for," said Micki Krause, editor of *Access Magazine*, a publication of the Chicago-based Information Systems Security Association.

Several companies, such as McAfee and Digital Dispatch, Inc. (DDI) in Lakeland, Minn., have begun to shore up their antiviral software packages before the Mutation Engine hits the U.S. in earnest.

"We disassembled a Mutation Engine, then wrote a code filter that looks through a program to spot Mutation Engine code," said Bill Kenny, a computer guru at DDI who said he tested the company's upcoming Data Physician Plus revision on 80,000 Mutation Engine infections. McAfee officials said their Viruscan package uses a similar method to "sense" the Mutation Engine's algorithm.

Although the Mutation Engine's presence has been felt more widely in Europe than in the U.S., its presence on bulletin boards could easily change that.

"If you have a modem, you can be in the virus business overnight," said William S. McKierman, vice president at McAfee.

Still, developers of antiviral software said they are prepared to head it off.

Compaq, IBM bank on service

CONTINUED FROM PAGE 35

program include a free, limited one-year on-site warranty service, a new technical forum on CompuServe, increased end-user training and a support staff that uses an artificial intelligence system to help solve problems.

IBM has buttressed its dealer service with HelpWare, a massive support initiative that encompasses leasing and training as well as standard support. The chief component of the program is its HelpCenter, a toll-free call-in center that can help users through IBM's byzantine organization and can also provide technical support in a safety net capacity.

James Cannavino, vice president and general manager at IBM's Personal Systems Group, said the response has been very positive: The system was bogged down with questions when the company announced its latest version of the OS/2 operating system.

Wrong drivers could trip up mouse in non-Windows apps

This is the first in a series of customer tips provided by Microsoft Corp. in response to questions commonly asked of Microsoft support personnel.

WINDOWS POINTERS

Q I have installed Windows 3.1 and my MS-DOS mouse driver, yet my non-Windows applications will only use the mouse while running full-screen. What can I do?

A Here are two things to check:

1. The MS-DOS mouse driver you are using might not support the use of a mouse pointer for non-Windows applications running in a window. If you have a Microsoft mouse, check to see if you have Version 8.2 of the MS-DOS mouse driver MOUSE.SYS and MOUSE.COM. If you have a Logitech mouse, use the LMOUSE.COM driver. These drivers are provided with Windows 3.1 and support the use of a mouse pointer for a non-Windows application running in a window. If you have something other than a Microsoft mouse, check with your mouse manufacturer for an updated driver.

2. You might be using a display driver that does not support the use of a mouse pointer for a non-Windows application. All the video drivers shipped with Windows 3.1 support this feature. If you are using a 16-color, 800- by 600-pixel video driver from the Windows 3.0 Supplemental Driver Library, then try using the generic Super VGA driver included with Windows 3.1 instead. If you are using a display driver that was provided with your display, you might need to update the driver. To get an updated display driver, check the drivers available on the Microsoft Download Service by modem at (206) 936-6735, or contact your display manufacturer.

DOS proves fine for 1-2-3 user

BY ROSEMARY HAMILTON
CW STAFF

The latest and greatest technology is not always the answer for everyone.

When Daniel Saint, a finance specialist at Chrysler Corp., tried out Lotus Development Corp.'s 1-2-3 for Windows last year, he said no thanks and went back to his DOS spreadsheet.

"I found 1-2-3 for Windows too overwhelming; [there was] too much stuff on the screen," said Saint, who works in Chrysler's international new venture development group in Highland Park, Mich. "There wasn't a benefit to everything that came with it."

A winner

Back in the DOS world, Saint worked both with the lower end spreadsheet, Release 2.3, and the more sophisticated version, Release 3.1+, which includes such advanced features as three-dimensional spreadsheets.

Recently, he agreed to beta-test 1-2-3 for DOS Release 2.4. This follow-on to Lotus' lower end software brings some of the Windows spreadsheet graphics to the DOS platform. Release 2.4, which Lotus officially announced earlier this month, is expected to be available in quantity this week, Lotus said.

"I'd say it's better organized and clearer" than 1-2-3 for Windows, Saint said. "It's what Windows needs to be — there's not all that junk on the screen."

Lotus' 1-2-3 for DOS Release 2.4 includes Lotus SmartIcons, a technology included in the Windows spreadsheet that the company is also adding to its entire set of applications. The SmartIcons allow users to click on a graphical representation of commonly used commands or functions to perform the task.

Saint said the Help system in Release 2.4 is also a big improvement over other spreadsheet Help systems, which he said are "hard to understand."

"You need a manual with you if you use all the capabilities of Lotus, and in my job, I do," Saint added. "The help [in Release 2.4] is more of an on-line manual."

Now Saint is awaiting 1-2-3 for DOS Release 3.4, the follow-on to Release 3.1+, which will have similar graphical capabilities as well as performance boosts. Lotus said it has scheduled a fall shipment for Release 3.4. "I go between 3.1 and 2.4," Saint said. "I really need the [2.4 enhancements] in 3.1."

The new HP PaintJet XL300 lets you make a splash without getting soaked.

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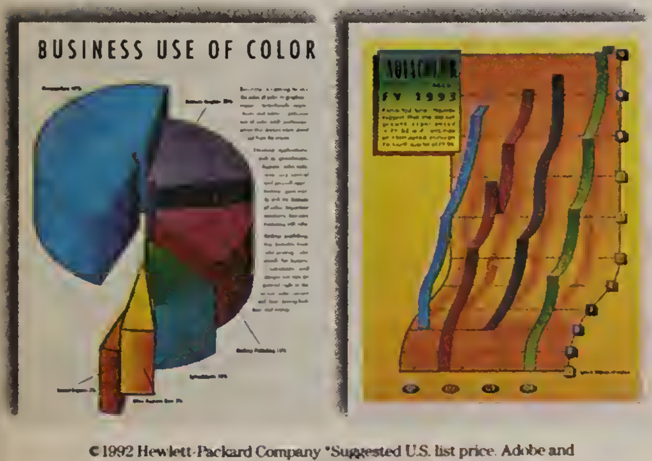

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Linking laptops to television sets

Willow Peripherals' Laptop TV *allows users to link their laptops to a television*

NEW YORK — A product that lets users link their laptop to a television was recently announced by Willow Peripherals.

Willow, a $2.5 million company that focuses on computer-to-video integration, released Laptop TV, a 2½-pound product that attaches to a portable's display port and feeds a Video Graphics Array image into a standard TV set. Willow has devised an antiflicker technology, ClearView, to improve the TV's reception.

C. Robert Paulson, president of AVP Communication, a video industry consultancy in Westboro, Mass., said the system's price of $1,195 could make the system attractive to a variety of people who want to use TVs for display purposes but have the more sophisticated, higher resolution computer realm for development. He said other tools on the market were in the $4,000 to $5,000 range.

MICHAEL FITZGERALD

Pen start-up lands retailer

BY MICHAEL FITZGERALD
CW STAFF

SALEM, Mass. — A little-known pen-based start-up has converted its first customer: Rich's Department Stores, Inc. is the first user of WriteAway, a new product from fledgling Arthur Dent Associates, Inc. in Tewksbury, Mass.

WriteAway allows users of keyboard-based Zeos International Ltd.'s 386+ notebooks to run pen software.

Howard Brooks, director of MIS at Rich's, said his company picked the Zeos notebook to gain access to WriteAway. "We were looking around for a notebook, and I want to work with pen technology because people in the stores don't want to deal with keyboards," Brooks said.

Rich's is switching its 26 stores to universal product code (UPC) labeling on the shelves instead of marking a price on each product. It currently has six Zeos notebooks, which use WriteAway and have a bar code reader attached, to serve as a UPC audit device.

"It's a necessary thing — we've got to get the stuff into the systems, and it beats by a long shot people running around with pencils and paper and writing [information] down," Brooks said. "We're trying to help them get more work done using computers."

Brooks said Rich's will put two notebooks in each of its stores and build a plan-a-gram — the plan for laying out a store — and order-entry applications for use in the stores. Rich's will use Gupta Technologies, Inc.'s SQLWindows product to write the applications, as it did with its UPC Audit application. Brooks said developing software for Windows for Pen Computing, Microsoft Corp.'s pen environment, had proved relatively trouble-free.

Brooks also said the Zeos notebooks connect readily with Rich's LAN Manager 2.1 network. The company's corporate information systems are based on Hewlett-Packard Co. 3000/950 and 3000/948 minicomputers.

NEW PRODUCTS

Systems

Facit, Inc. has introduced N1200, an industrial portable personal computer.

Created for factory-floor applications, N1200 is an IBM-compatible 80286 PC that is self-contained. It has a Color Graphics Adapter display, keyboard, 3½-in. floppy disk drive, optional hard drive and interfaces to numerical control machines, printers and other peripherals. The N1200 can be used for industrial applications as a stand-alone PC or be connected to a local-area network.

The Facit N1200 costs $3,489 with 512K bytes of memory and no hard drive, and $4,189 with a 40M-byte hard drive, 2.5M-byte memory and numerical control/distributed editing software.

Facit
University Center
400 Commercial St.
Manchester, N.H. 03108
(603) 647-2700

Software applications packages

Silicon Beach Software, Inc., a subsidiary of Aldus Corp., has started shipping Aldus Gallery Effects: Volume 1, Classic Art for Microsoft Corp.'s Windows.

Gallery Effects for Windows automatically transforms scanned photographs and other bitmapped images into painting-like artwork. Sixteen customizable master effects are offered, including charcoal, dry brush, graphic pen, mosaic and watercolor.

The product is priced at $199.

Silicon Beach Software
Suite J
9770 Carroll Center Road
San Diego, Calif. 92126
(619) 695-6956

MySoftware Co. has introduced MyQuickWriter, a word processor.

The program offers customizable pre-written business letters and business letter style guides that include Full block, Semiblock and several others. MyQuickWriter has pull-down menus and editing capabilities that allow users to move or rearrange blocks of text.

MyQuickWriter costs $24.95 and requires 512K bytes of random-access memory and DOS 2.0 or greater.

MySoftware
Suite 167
1259 El Camino Real
Menlo Park, Calif. 94025
(415) 325-9372

American Training International has introduced TourGuide, an interactive authoring software product.

TourGuide users can develop multimedia applications and create media objects such as scenes containing images, pictures, line shapes and text that can be set in motion using animation. A variety of text styles and fonts, graphics tools and patterns are available with TourGuide along with a map feature that illustrates all tour routes, including intricate hypercard types of user-controlled tours.

TourGuide is priced at $2,995.

American Training International
12638 Beatrice St.
Los Angeles, Calif. 90066
(310) 823-1129

Peripherals

Mouse Systems Corp. has introduced NewPoint, a miniature trackball for portable computing.

NewPoint has a 200 counts-per-inch (CPI) base resolution, is adjustable via Mouse Systems' bundled ballistic driver software from 20 to 6,400 CPI and supports Microsoft Corp's protocol. NewPoint can be used with any IBM XT, AT or Personal System/2 compatible. It requires DOS 3.3 or higher, 256K bytes of random-access memory, a RS-232C port and a 3½-in. disk drive.

The NewPoint miniature trackball costs $129.95.

Mouse Systems
47505 Seabridge Drive
Fremont, Calif. 94538
(510) 656-1117

Power supplies

Falcon Electric Co. has expanded its Falcon UVS Plus L Series with two new models: 400-VA UVS400VA-1L and 800-VA UVS800VA-1L.

The units are uninterruptible voltage sources (UVS) designed for microprocessor- and microcontroller-based equipment in engineering, manufacturing and computing environments. According to the company, UVS Plus prevents daily power disturbances such as brownouts, sags, spikes, surges and noise from reaching sensitive equipment.

UVS400VA-1L is priced at $890 and UVS800VA-1L at $1,090.

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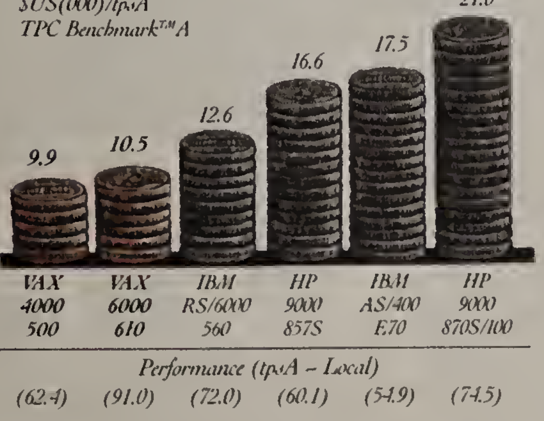

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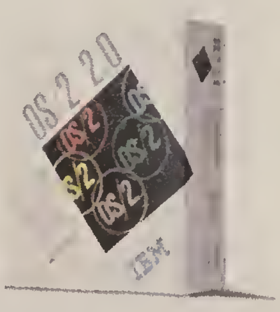

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U.S. agency cultivates pockets of computing around the globe

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Foreign Agricultural Service (FAS) faces challenges to distributed computing that would give many information systems managers nightmares: It has 90 offices around the world, all are dependent on IS but have no local technical staff, and many are located in Third World countries far from spare parts and maintenance services.

But that is not deterring the agency of the U.S. Department of Agriculture from a $5.5 million project to install Wang Laboratories, Inc. personal computers and Banyan Systems, Inc. local-area networks at its far-flung sites. The agency hopes to end up with more reliable systems under its own control and to improve the sharing of data and resources in its offices.

The mission of the FAS is to boost exports of U.S. agricultural products — now at $40 billion annually — and to track overseas sales and sales opportunities. Information about supply and demand is sent from the FAS' foreign offices via electronic mail to a forecasting system here that is a key determinant of commodities futures prices.

The FAS shares space at U.S. embassies with the U.S. Department of State and, until recently, it also shared the State Department's Wang VS minicomputers. The FAS accessed the minicomputers via dumb terminals and also used old stand-alone Wang PCs. The FAS has just completed the first phase of its project, which was to move its office automation applications off the minicomputers and to place 33-MHz 80386-based Wang PCs on the desks of all 450 employees overseas.

The key objective in Phase 1 was to upgrade hardware in a way that would be virtually transparent to users, said Phillip C. White, director of the FAS' Information Systems Management Division. "A large number of our staff are foreign nationals. We wanted to give them a new box but not scare them off," he said.

The PCs have modems through which E-mail and file transfers can be sent to the U.S. via local Postal Telephone and Telegraph authorities and Sprint Corp.'s SprintMail.

World networks

In Phase 2, now about one-quarter complete, the FAS is setting up Banyan LANs running the Vines operating system at 75 of its 90 embassies and at headquarters here. Wang's PC 380/33C boxes are being used as both clients and servers.

"We are doing this so we can use a client as a server if the server goes down," White said. "Maintainability is an incredibly difficult issue because of some of the remote locations."

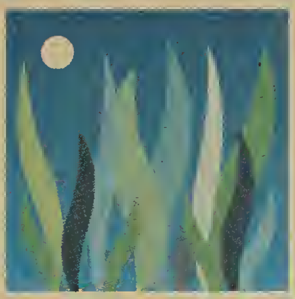
Because the FAS' overseas personnel are nontechnical — most are agricultural economists — the FAS wrote a piece of software it calls LAN Manager, or LAN Man (not related to the Microsoft Corp. product). After the LAN server and connections are installed, usually over a weekend, LAN Man is run on each previously stand-alone PC. It automatically moves data files and infrequently used applications to the server, leaving most executable code on the client.

LAN Man is also used after LAN installation to automate

Continued on page 44

ON SITE

Foreign Agricultural Service
Washington, D.C.



- **Challenge:** To add computing power for staff stationed at U.S. embassies throughout the world without adding local technical personnel.
- **Technology:** Wang PCs on Banyan Vines networks and an in-house written software package called LAN Manager.
- **Expected results:** Greater system reliability; improved sharing of data and resources.

CW Chart: Tom Monahan

Managers look at bright side of monitor

BY JIM NASH
CW STAFF

Network managers are looking beyond some flaws in Brightwork Development, Inc.'s new LAN Server Watch monitoring software to offer praise instead. Server Watch, slated to ship this month, will monitor Novell, Inc. NetWare 2.X networks.

Although Server Watch is billed as a tool for monitoring NetWare 3.X networks, managers using beta-test versions of the product said its capabilities at that level are limited.

Brightwork reportedly is waiting for Novell to publish application programming interfaces for NetWare 3.X rather than write its own and risk incompatibility with interfaces Novell might publish for NetWare Version 3.11 or 3.2.

The software differentiates itself from other network monitors, said Mike Neuburger, network engineer at the University of Oregon's computing center in Eugene, in its support for Microsoft Corp.'s Windows. That support enables a manager to run Server Watch as a Windows application in the background, watching for and reporting errors, file server disk use, network traffic and other conditions.

Neuburger said he received an early version of the software two months ago. He applauded its graphical display of key network conditions. There are fewer graphics available for NetWare 3.X, he explained. There is a checklist of common problems for each NetWare version that can help novices with problem solving.

A few drawbacks

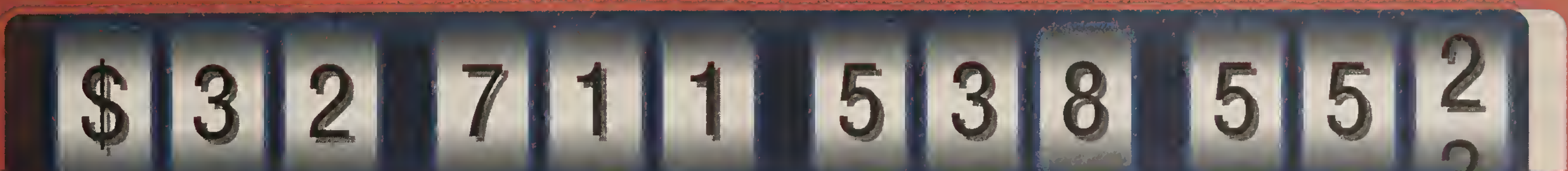
However, newcomers to network management might be put off by the documentation, which is confusing, said a network engineer whose company policy prohibits his being identified.

"It's a very immature product now, but it's a good start," the source said of his beta-test version. "It did everything it was advertised to do."

The source noted that he had trouble manually overriding alert thresholds partly because of clumsily written documentation. He said the Tinton Falls, N.J.-based company should easily be able to clear up manuals before the product ships later this month.

However, he, too, praised Brightwork's efforts at simply displaying information, such as the percentage of disk space occupied in a server.

The software will list for $695 for each server license. It can monitor a maximum of 100 servers simultaneously. Licenses for servers with more than 100 users will list for $1,495.



By the end of this week Computerworld readers will have spent over $32.7 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD
The Newspaper of IS

Source: IDG Research Services, Fall 1991

Agency grows global computing

CONTINUED FROM PAGE 43

and simplify system housekeeping associated with maintenance and the adding and deleting of accounts.

"We're in a unique environment overseas with no technical people," said Gary Tarr, chief of IS development. "The goal is to hide the complexity of Vines from users."

Agricultural Services' White *needed systems that could run at points around the world with little support*

Currently, the FAS field personnel have asynchronous E-mail links to Washington, D.C. In Phase 3 of the project, the FAS will upgrade its networking topology to X.25 packet switching using a planned State Department network for unclassified traffic. That will allow interactive communications, including access to the FAS databases in Washington, D.C.

"Users might want to get trade statistics not available locally," Tarr said.

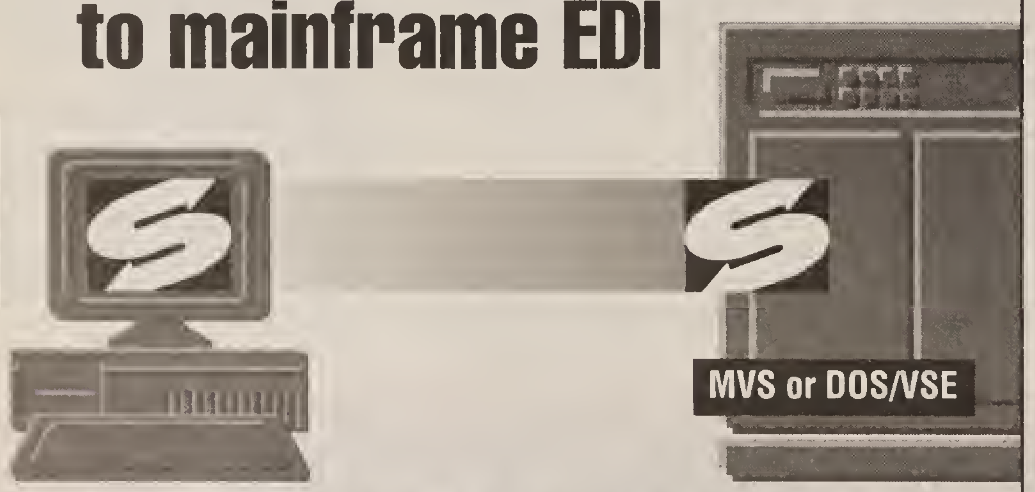
According to White, one of the reasons the FAS chose Wang was because the FAS is one of five agencies authorized to order from an $841 million, 11-year contract signed by Wang and the State Department in 1990.

He also said the ability to ride the coattails of the huge agency gave the FAS good leverage with the vendor.

It also presented an opportunity at the FAS headquarters that looked too good to pass up, White said.

Now that Wang has an agreement with IBM by which it can sell RISC System/6000 workstations and servers under the Wang name, the FAS can use the same State Department contract to buy the Unix-based RS/6000s — which conform to federal standards for open systems — to replace its six aging, proprietary Digital Equipment Corp. VAXs.

Now, there's an easy way to take the big step to mainframe EDI



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XcelleNet revises Forms

Version 1.2 to ship this month; users applaud new features

BY JIM NASH
CW STAFF

Network managers are applauding revisions made to XcelleNet, Inc.'s RemoteWare Forms software.

The application, which enables managers to develop custom forms and automatically distribute them over a wide-area network, is scheduled to ship this month. Early users of Forms Version 1.2, however, are already talking about expanding installation plans.

Forms works in conjunction with Atlanta-based XcelleNet's RemoteWare Communications Management System and RemoteWare AppliComms. The software provides tools to build and manage dial-up communications as well as custom applications that operate over such networks.

Version 1.2's new features include forms routing, which can pull forms along a defined path of offices. For example, it can move travel expense records from one point of approval to another. The new edition also adds remote access to SQL databases. In the past, remote offices would have to write or call information systems for data on the central database.

"I can tell you that I'm gonna love this," said John Wingate, director of management information and communications systems at Marsh Village Pantries, Inc., referring to the remote access to SQL databases.

Wingate said he has worked with Forms since it was a beta-test product in 1989. Now he is preparing to move from the beta-test version of 1.2 to full production throughout the chain's 175 stores in Ohio and Indiana. Marsh Village Pantries, based in Indianapolis, is a division of Marsh Supermarkets, Inc.

Productivity will improve throughout the chain, for example, when store managers can send a database request about their stores' performance electronically, Wingate said.

The software will be used to maintain productivity at franchised outlets of Mail Boxes Etc., based in San Diego, said Mark Gaydos, telecommunications manager for Mail Boxes and its 1,700 franchises. Gaydos said a large copier vendor is seeking to reduce the number of its service centers nationwide by having customers bring faulty equipment to local Mail Boxes outlets, which will forward the equipment.

Forms flexibility

Gaydos explained that Forms will be used to build a custom form for those transactions and will route them to the appropriate offices. Gaydos and Wingate each said they had looked around for work-flow software specific to their industries but found nothing that allowed for the degree of forms development flexibility exhibited by XcelleNet's software. Neither said he could find significant problems with its operation.

"The question to ask is, how productive can you make the [store] manager?" Wingate said. With Forms, store managers save about 16 hours each week by not having to manually draw up end-of-day business reports and ship them to the headquarters. They can complete electronic forms that closely resemble their paper predecessors and post them on their IBM-compatible personal computers. The electronic forms are then automatically loaded onto the IBM OS/2-based file server in Indianapolis.

Gaydos cited XcelleNet's support. "It's about the best I've ever received," he said.

Forms runs under OS/2 on the central server and under Microsoft Corp.'s Windows on the remote client.

FDDI EISA cards debut

Network speeds are increasing, notably with Fiber Distributed Data Interface (FDDI) network cards. This month, SysKonnect, Inc. in Saratoga, Calif., announced FDDI Extended Industry Standard Architecture (EISA) cards, which, according to the company, nearly double transfer rates.

The company, which declined to offer a list price for the cards, said the cards moved server packets at 8.5M byte/sec. and client packets at 2.4M byte/sec. Both figures were derived from Novell, Inc.'s Perform 3 benchmark.

In June, SysKonnect is scheduled to deliver FDDI EISA network cards for single-attachment, dual-attachment and shielded twisted-pair environments. It also plans to deliver another IBM-proposed standard FDDI card, the FDDI EISA Shielded Twisted Pair Data Distributed Interface. The cards will support Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager and The Santa Cruz Operation's implementation of Unix.

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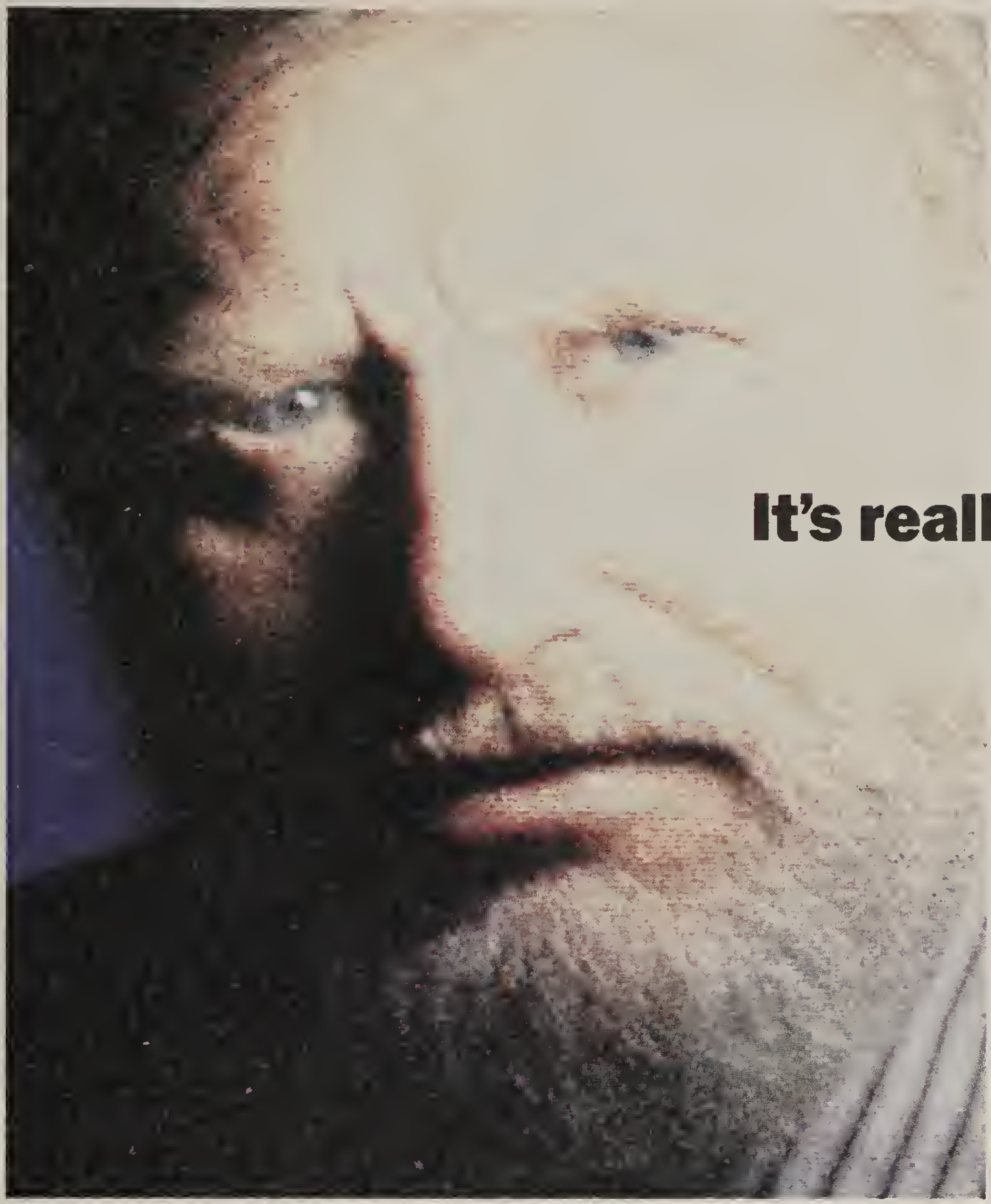

It's really this simple.

Show me a new workstation with better numbers, and you'll get my attention.

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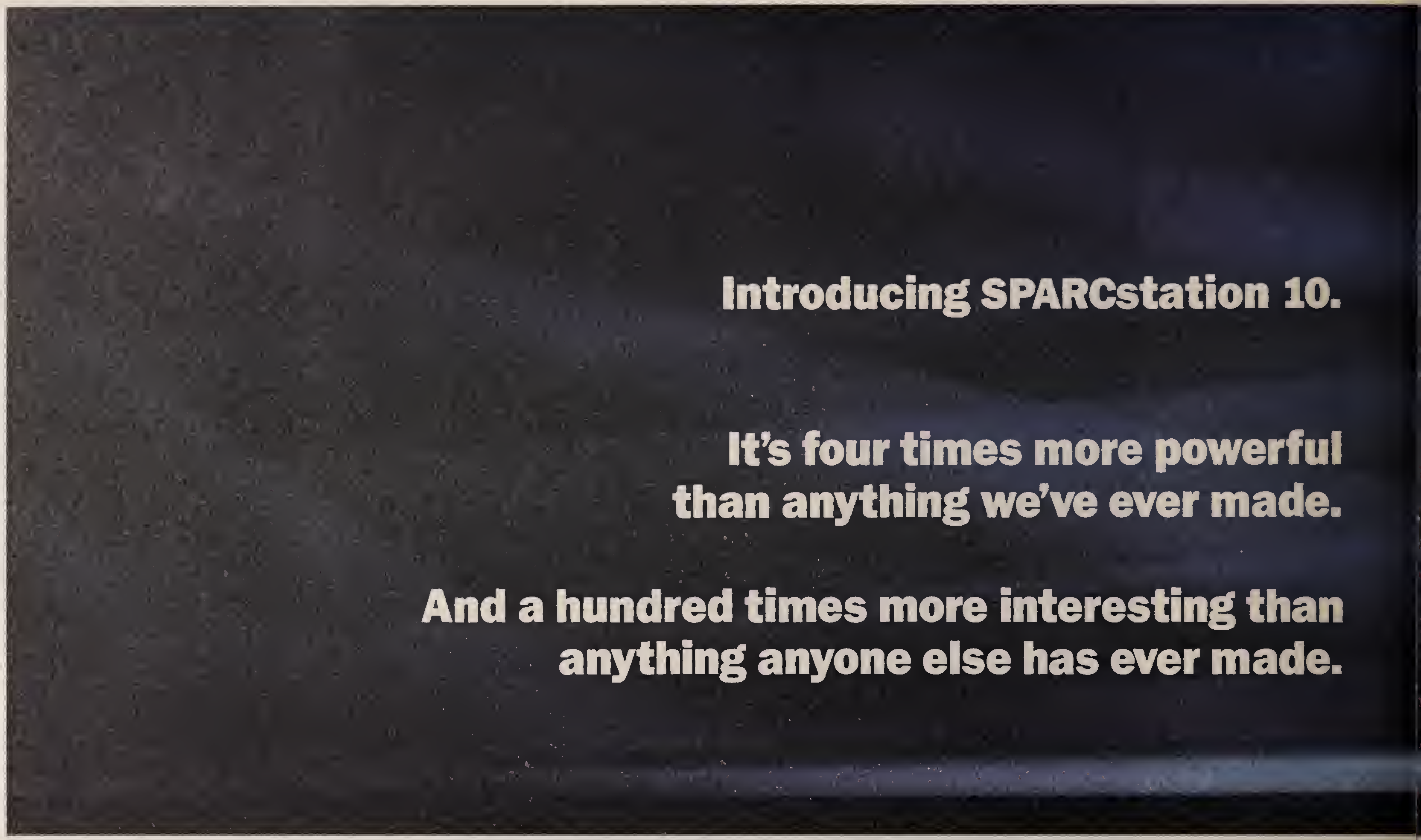

Introducing SPARCstation 10.

It's four times more powerful than anything we've ever made.

And a hundred times more interesting than anything anyone else has ever made.

You can hardly flip through a computer magazine today without bumping into some vendor's announcement of a new workstation. Yet we all know what's really being announced:

New chip benchmarks. New prices. Maybe a new model number.

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A powerful new workstation that runs your applications better than any other desktop on earth.

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If that's your idea of a truly new workstation, meet the SPARCstation™ 10 system.

The only performance that matters.

One of our engineers describes performance this way: What good is a turbo-powered engine if the car's transmission is sluggish? Or its tires are flat?

His point is that building faster CPUs makes little difference if the rest of the computer can't keep up.

So for the new SPARCstation 10, Sun™ devised an entirely new workstation, from the footpads up. Not only with a faster CPU, but with a faster system bus, faster input/output, faster networking, and built-in multiprocessing.

Multiprocessing Performance

Solaris
SPARC

Binary Compatible

The faster CPU is our remarkable — and reassuring — new SuperSPARC™ chip.

Reassuring, because SuperSPARC is binary compatible with previous generations of SPARC.® It runs the Solaris® operating environment, too, so you can use thousands of existing applications.

And remarkable, because SuperSPARC can handle three instructions at once (most others manage only one or two). Imagine what that does for sheer processing speed.

Now here's where things really start cooking:

We teamed all that horsepower with the extra performance of multiprocessing. One megabyte of SuperCache™ memory. A 320-megabyte-per-second peak memory bandwidth. A 10-megabyte-per-second SCSI disk

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controller. And a large I/O buffer for faster Ethernet transfers.

10 MB/Sec. Disk Input & Output

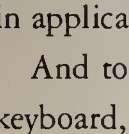
Individually, each of these represents a big step forward in computing performance. But together they produce an astonishing leap ahead in application performance.

And to the person whose hands are on the keyboard, that's the only kind that matters.

Growing up vs. growing old.

Though budgets have never been tighter, most workstations are still designed around the belief that you're willing to replace last year's computer just to work with a newer processor.

The SPARCstation 10 was designed around a different philosophy: Make the processor replaceable, not the workstation.



Plug-In SPARC Modules

To that end, we put the processor on a small SPARC module that plugs into the motherboard. As faster chips become available, you can upgrade by pulling out the old card and plugging in a new one.

The rest of your investment — memory, storage, accelerators, everything — is left intact.

But don't feel you have to wait around for faster chips. You have the freedom to grow a SPARCstation 10 in plenty of ways right now.

You can start by plugging in a second SPARC module. Since this machine was engineered throughout for symmetric multiprocessing, a second module will nearly double its processing power.

Built-In ISDN Networking

You can also boost its memory to 512 megabytes. And its disk capacity to 26 gigabytes.

There are ports for both parallel and serial devices; connections for thick, thin, or twisted-pair Ethernet; even ISDN connectors for networking over public telephone lines. All built in. Which leaves its four expansion slots available for other functions.

To sum up, we hope you like the way Sun's SPARCstation 10 looks on your desk.

Because it's going to be there quite a while.

The future is not an option.

As innovative as computer companies try to be, they usually can't keep up with what people like you are ready for.

For instance, how long have you been hearing about promising new technologies like multiprocessing? Multimedia? ISDN?

And how many workstations can you name that give you all these capabilities, right out of the box?

There's only one. And you're looking at it.

You've already read how the SPARCstation 10's multiprocessing can speed up the applications you run today. But it also means you can add enough horsepower later to run next-generation software built around multithreading and object management.

Then there's ISDN. It brings the worldwide telephone network directly into the computer — without modems. Which allows applications to make faxing, voicemail, and even video conferencing as natural as printing.

A 16-bit audio chip and external speaker are also included. So applications can use CD-quality sound for e-mail, spoken tutorials, and multimedia presentations.

And there's enough memory, disk space, and bus bandwidth to meet the enormous demands of animation, simulations, and real-time video.

Oh sure, there are plenty of options you can add to this computer.

The future, though, is standard equipment.

Admit it, you're intrigued.

You can't have read this far without feeling at least a twinge of excitement.

Maybe it's for the swift kick-in-the-pants this machine can give to the applications you're already running today.

Or the enthusiastic way it welcomes whatever promising new technologies might be around the corner.

Maybe you simply can't help but respect a computer that offers your business a lot more than just MIPS and MFLOPS.

Whatever you think, here's what to do:

Call 1-800-426-5321, ext. 485, for complete information on the SPARCstation 10, or for the name of your authorized Sun reseller or sales representative.

It's the first workstation to combine such powerful numbers with such potent ideas.

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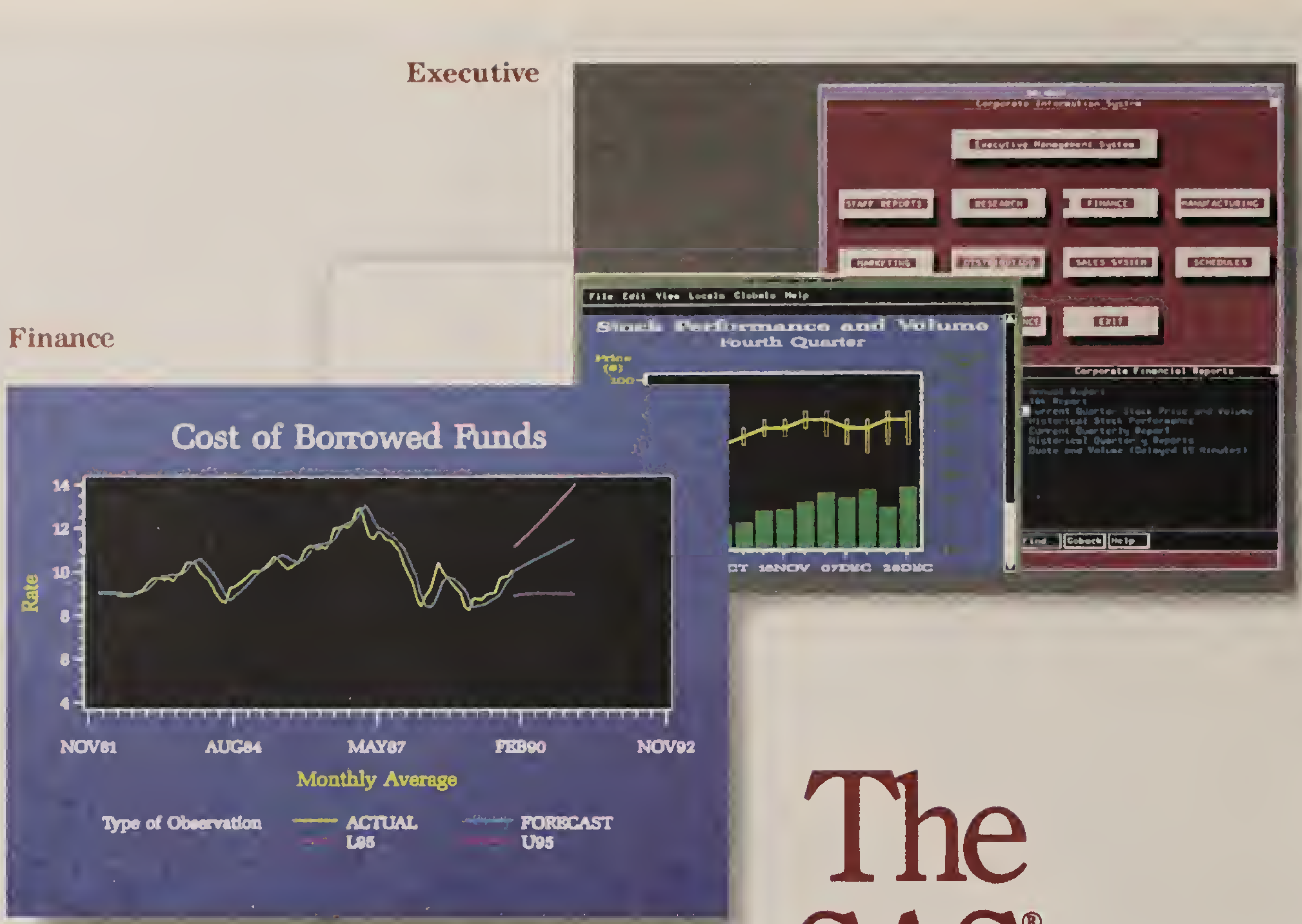

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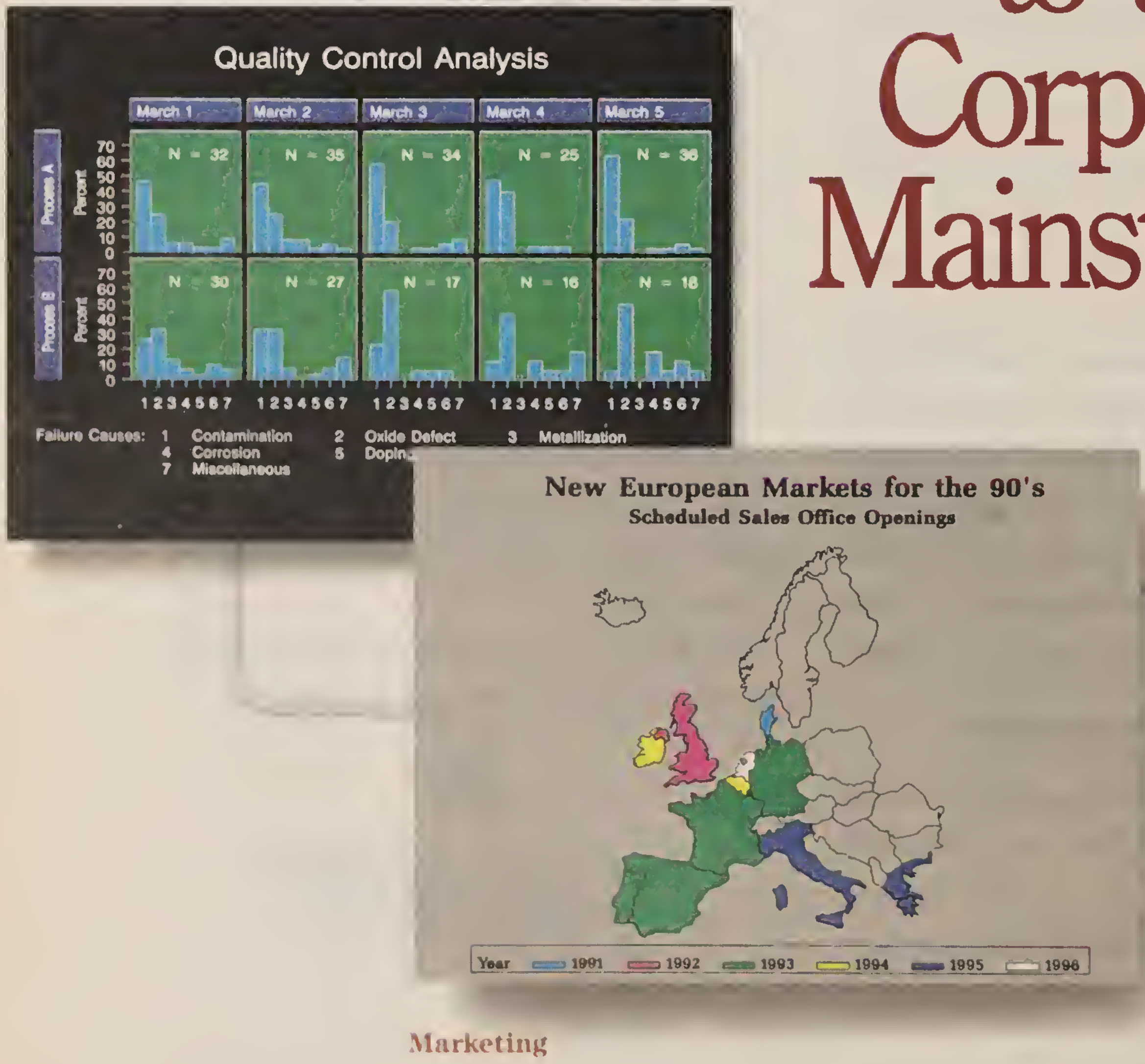

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The SAS System helps UNIX do what UNIX does best. It's never been easier to exploit all the price/performance advantages of UNIX...or to connect UNIX with other systems throughout your organization. That's because the SAS System's powerful data access, management, analysis, and presentation tools work the same way on UNIX workstations as they do on host machines.

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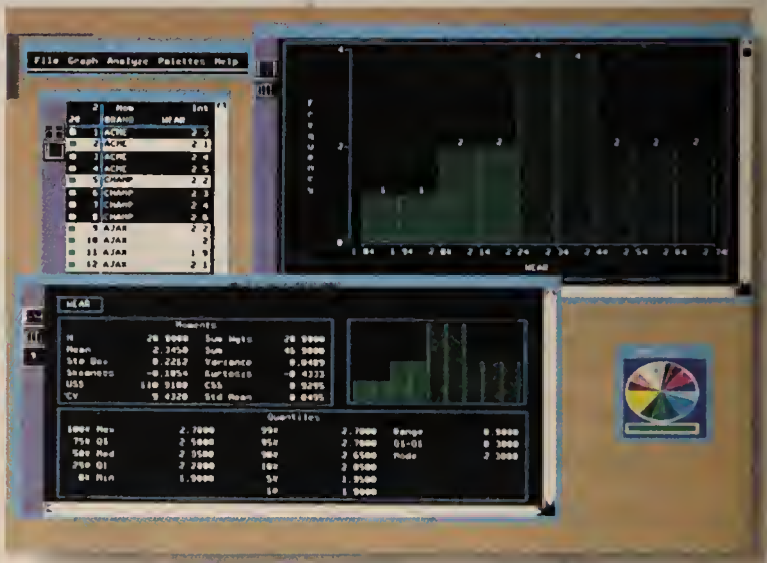

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Bumpy road to client/server Unix at CW

Support, training, software snags delay Phase 1; conversion running two months behind schedule

BY MARYFRAN JOHNSON
CW STAFF

Third in a series of reports on Computerworld*'s own migration to new systems.*

FRAMINGHAM, Mass. — The thrill of pioneering new publishing software is wearing thin at *Computerworld* these days, as we approach the end of Phase 1 in our conversion to Unix-based client/server computing.

We are running two months behind schedule in the five-stage project, with the September deadline moved back to December. Several factors are responsible, including delayed hardware shipments of both IBM Personal System/2s and RISC System/6000s, problems with software installation and user training and our own delays in choosing typeface fonts.

But more importantly, the initial hand-holding support we received from Atex, Inc. for its new Workgroup Publishing System has flagged a bit. Other sites such as *Golf Digest* and *Congressional Quarterly* have signed on for Atex's Unix-based publishing software, so Atex resources once focused solely on us must now be shared.

"At first, Atex was putting our installation on their list as critical to the success of the product. Now we're less critical," said Paul Gillin, executive editor at *Computerworld*. There is also a shortage of Atex experts versed in both the newspaper production business and the Workgroup Publishing System, which runs under IBM's AIX Unix variant.

The key expert and linchpin of our project's success is Dora Jeffers, manager of technical and customer support at Atex in Billerica, Mass.

"Dora understands our problems and our system better than anyone," said Catherine Gagnon, *Computerworld*'s chief copy editor. "When I have a problem, I call Dora and she helps me. If she's not there, it's still a problem."

The project has been under way for six months now, but it was only a few weeks ago that a preliminary copy of the Atex documentation arrived, Gagnon added.

Don Hollands, vice president of general publishing at Atex, said he is well aware of the support concerns and is working to provide more skilled technicians. "All of us have learned from this first pilot scheme at *Computerworld*," he said. "We are still confident we can meet the high demand and level of support needed."

While there are complaints from the editorial — or end-user — side of the house, *Computerworld*'s Information Systems Director Linda Nelson takes a broader and more benign view of the conversion effort. "From my perspective, Atex has addressed our concerns in a timely fashion," Nelson said. One example she cited was the help Atex provided recently with a customized piece of code needed to solve a software glitch between a file-storing format on the Apple Computer, Inc. Macintosh and the Atex system residing on the RS/6000.

COMPUTERWORLD

***Computerworld*'s client/server conversion involves the following:**

- An $850,000, five-phase hardware and software installation ending in December 1992 and replacing four DEC PDP-11 minicomputers in a host/terminal environment.
- Two IBM RS/6000 servers as the main processors, with either 34 IBM PS/2 Model 35SX writer workstations or 80386-based PCs; 14 PS/2 Model 90 page-makeup editor workstations and Ethernet connection to seven Apple Macintoshes for graphics.
- Atex's Unix-based Workgroup Publishing Software on the RS/6000s, with the PS/2s running Xywrite word processing software and PC Page Makeup software.

So far, of the eight copy editors, Gagnon is the only one thoroughly trained in using the new application. With help from one other copy editor, she is now producing our Computer Careers and Marketplace section pages on a PS/2 Model 90 page-makeup workstation. The goal, however, had been to have 50% of the roughly 130-page newspaper produced on the new system by now and 18 workstations installed instead of only two.

"We really need to get more people trained," Gillin said. "Atex is promising to fix that, and we have to take them at their word."

Among the software snafus that had to be resolved was trouble making the "callout" function in the new application work correctly. A callout is a quote or phrase pulled from the text of an article and highlighted in a separate box for emphasis. After spending days of frustrating effort on the callout command, Gagnon finally solved it with help from an Atex support technician.

There have also been unexpected problems in trying to "hot link" the graphics produced by *Computerworld*'s seven-machine Macintosh network to the RS/6000 Model 520 server. Although the interface to directly connect the graphics group to the RS/6000 does exist, the IS department is still testing it, Nelson explained. "We don't want to connect the server to the live Mac network, which is a mission-critical system, until we are fully comfortable with the technology," she noted.

On the positive side, page production is much faster — "when it works right," Gagnon noted. "A simple page can be completed in 15 minutes now, and the process used to take about an hour."

Yet, the slower ramp-up has its upside. "People are concerned that we're just bumping along with two or three pages in live production now, but they forget what a huge conversion effort this is," the chief copy editor pointed out. "I think it's better to be dealing with these problems now, while just a few pages are in production. I don't need seven copy editors tearing their hair out the way I've been."

NEW PRODUCTS

Systems

Kingston Technology Corp. has announced the availability of memory upgrades for Hewlett-Packard Co.'s Series 9000 workstations and Series 9000 and 3000 servers.

The upgrades are available in configurations ranging from 1M byte to 64M bytes, depending on the workstation or server model.

Pricing starts at $140 for a 1M-byte upgrade for the HP Apollo Series 9000 Model 700RX workstation. A 64M-byte upgrade for HP Series 900 Model 720, 730 or 750 workstations is priced at $16,000.

Kingston Technology
17600 Newhope St.
Fountain Valley, Calif.
92708
(714) 435-2600

Modems

Cettlan Corp. has introduced SecureModem 1032e, a V.32 callback security modem.

Designed to protect dial-in networks from unauthorized access, the SecureModem 1032e can support 105 remote users and features full-screen, built-in menus for security configuration.

SecureModem 1032e uses password verification with one of three security levels: direct connect for immediate host access; predefined callback for callback to a prestored number or for users that are traveling; and user-defined callback for callback to a user-defined number.

Standard communications software is used, and SecureModem 1032e can function in non-callback mode as a regular modem.

SecureModem 1032e costs $595.

Cettlan
10 Blazing Star
Irvine, Calif. 92714
(714) 559-4016

Software applications packages

SoftSolutions Technology Corp. has announced the Microsoft Corp. Windows version of SoftSolutions' document management software.

SoftSolutions for Windows can be integrated with other menuing systems and applications, providing transparent access to document management within third-party programs. The Windows version can share a central image database with the DOS version of SoftSolutions. Windows Object Linking and Embedding, Dynamic Data Exchange and Clipboard technologies are supported.

SoftSolutions for Windows costs $495 per file server plus $295 per additional workstation. A stand-alone version is priced at $495.

SoftSolutions Technology
ParkView Plaza
625 S. State St.
Orem, Utah 84058
(801) 226-6000

Micro Engineering Solutions, Inc. has launched Version 5.2 of its Solution 3000 computer-aided design software.

Enhancements include a Flow, Drive and Check Machining feature and new tool and material libraries.

Solution 3000 can also calculate the volume and surface area of a surfaced model.

An Initial Graphics Exchange Specification (IGES) translator is also included at no extra charge. Previously, the IGES translator cost extra.

The software supports personal computers as well as workstations from Sun Microsystems, Inc. and Silicon Graphics, Inc. Pricing starts at $3,500.

Micro Engineering
Solutions
26200 Town Center Drive
Novi, Mich. 48375
(313) 347-9650

Local-area networking hardware

Harris Adacom Corp. has created CoaxNet.

CoaxNet connects personal computers equipped with a 3270 coaxial board to local-area networks. Versions for Token Ring and Ethernet connections are offered. The PC connected via CoaxNet has access to all Novell, Inc. NetWare services.

The Ethernet version costs $7,000. The Token Ring version costs $8,000. Both include a one-year warranty.

Harris Adacom
16001 Dallas Pkwy.
Dallas, Texas 75248
(214) 386-2000

Local-area networking software

Independence Technologies, Inc. has enhanced its Iview System Manager software product.

The product monitors and manages hardware and software on local-area networks. New features include enhanced alarm forwarding, distributed management and line management.

Iview handles an unlimited number of networked devices. Currently, support is offered for Sun Microsystems, Inc. workstations, with other platforms to be added.

The product costs $14,500.

Independence Technologies
42705 Lawrence Place
Fremont, Calif. 94538
(510) 438-2000

Utilities

Cambex Corp. has created Certi-Copy, a tape-duplication software utility.

Certi-Copy allows IBM RISC System/6000 users to simultaneously duplicate IBM AIX software, totaling up to eight copies of magnetic tape information. It is compatible with any IBM 7207 or Cambex ¼-in. cartridge tape drives connected to an RS/6000 processor.

Single copies cost $7,500.

Cambex Corp.
360 Second Ave.
Waltham, Mass. 02154
(617) 890-6000

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Aug. 22, 1991 - Statue of KGB founder Felix Dzerzhinsky is dismantled, signifying the beginning of a new freedom to communicate.

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They have the high performance drivers to support virtually any network operating system. And, they let you alter your PC architecture, cabling and speeds without having to buy a new board.

If you change PC architectures, you just flip your existing IRMAtrac board from its ISA/EISA side to its Micro Channel® side. (Or vice versa, of course.)

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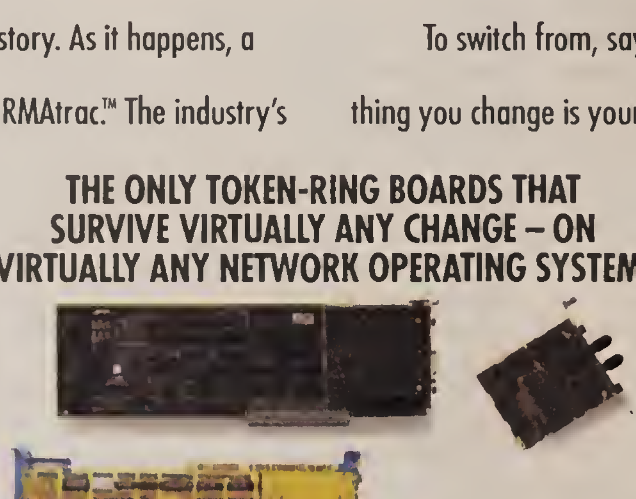

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Novell Labs Tested & Approved

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ENTERPRISE NETWORKING

INTERNETWORKING • SERVICES • NET MANAGEMENT

Net management firms look for partners

BY ELISABETH HORWITT
CW STAFF

A frenetic game of "choose your partner" is going on in the integrated network management arena. Rather than reinvent the wheel, major players have been aggressively seeking third-party applications to broaden their platforms' multivendor support and functionality.

Still missing, however, is broad industry support of standardized application programming interfaces that would allow users to freely mix and match their favorite network management software with their choice of management platform.

"The point is, none of these vendors, even IBM, can afford to go it alone in terms of providing application solutions," said David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn. "The only successful [network management] platforms will be those that win the hearts and minds of ISVs that can develop the right applications."

Jumping on bandwagon

Novell, Inc. upped the ante earlier this year by announcing dozens of third-party supporters for its new NetWare Management System. Hewlett-Packard Co. did the same late last month by announcing, with its new version of OpenView, that the number of third parties supporting the system has risen in the past few months from 40-plus to more than 100.

During the last couple of weeks, other vendors have followed suit. Sun Microsystems, Inc. announced Version 2.0 of SunNet Manager, its Simple Network Mangement Protocol (SNMP)-based network management system, and emphasized the product's ability to deliver full functionality "right out of the box." SunNet Manager has long suffered from a widespread industry impression that it is less an end-user product than a framework and a set of programming tools.

Contributing to the plug-and-play aspect of the introduction was Sun's announcement of 35 additional independent software vendors whose network management applications can run on SunNet Manager.

Perfect timing

IBM's AIX NetView/6000 began shipping the middle of this month, six weeks early. At the same time, IBM announced the first round of third-party support for the SNMP-based network management system.

Tandem Computers, Inc. also announced the availability of NonStop Net/Master, a system that is said to manage both Tandem and IBM networks. Jointly designed by Tandem and Systems Center, Inc., the platform is said to work with Tandem's Distributed System Management product for managing Tandem computers. Among its features are the following:

- The ability to invoke either IBM's NetView or Systems Center's Net/Master for managing IBM Systems Network Architecture (SNA) installations.
- Systems Center's Network Control Language allows users to generate customized management applications on Tandem Guardian systems.
- Tools for generating automated response to network events.
- Some initial applications geared to Tandem's fault-tolerant environment. For example, software is available to automatically recover services after a system failure, a Tandem spokesman said.

Continued on page 54

Priority for users: Easy way to manage networks

BY ELISABETH HORWITT
CW STAFF

FRAMINGHAM, Mass. — Only about 20 of 100 companies recently surveyed by International Data Corp. (IDC) currently use one integrated platform to manage the bulk of their corporatewide systems and networks.

However, many of the respondents to the research firm's April 1992 survey cited a critical need within their companies for several of the features promised by integrated network management platforms. Foremost is an easier way to manage a mishmash of multivendor systems and networks.

Complicating the job of network managers is the need to gather management information from proprietary systems installed to manage multiplexers and modems, as well as local-area network adapters, hubs, routers and operating systems, said Doug Gold, IDC's director of communications research, who wrote the report.

As a result, managers are putting a priority on any tools that will put this "overwhelming amount of information" into an intelligible format, he added. "They want something to tell them what is important and what is not."

Some 72% of users surveyed cited the increasing complexity of network architectures and the inability to efficiently administer those networks as a serious problem. About 55% cited ease of use as a "very critical" network management feature.

Right now, many users are turning to the Simple Network Management Protocol (SNMP) as the closest thing to a multivendor network management solution now available on the market, Gold said. Although SNMP currently lacks critical features, such as security, Gold said, "You give a starving man a crust of bread, and he thinks it's a meal."

Over one-third of the companies surveyed said they are currently using SNMP.

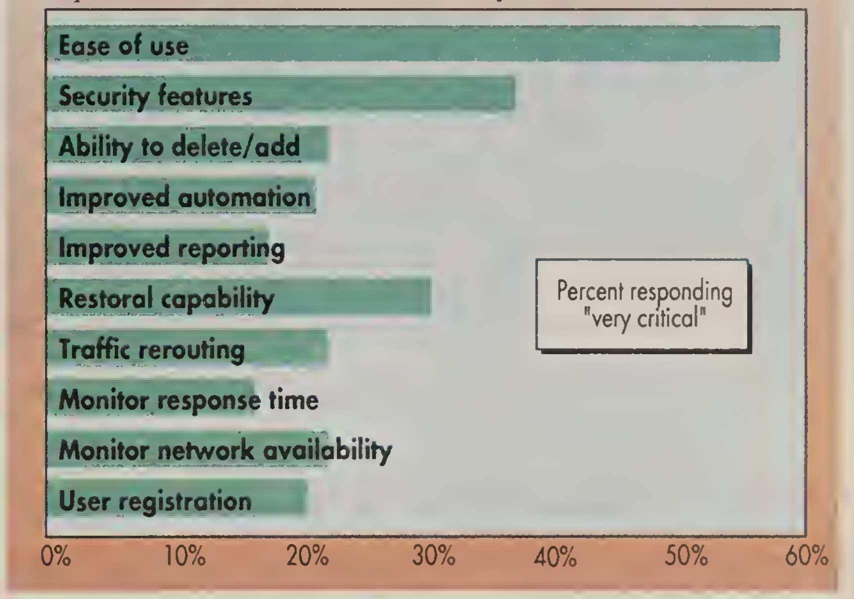
CMIP trails behind

In contrast, 54% of the respondents stated that they did not intend to migrate to the Open Systems Interconnect Common Management Information Protocol (CMIP). One reason for this hesitancy is the lack of available CMIP products, despite the fact that the majority of network and computer vendors have promised support of the standard sometime in the future, Gold said.

One factor that may boost CMIP support is the emergence of a mature version of the Open Software Foundation's Distributed Management Environment (DME), Gold said. DME promises to provide common interfaces for network management applications, with underlying support for both SNMP and CMIP.

But while users indicated an interest in DME, the standard is several years away from commercial viability, he said.

An average of 15% of the total information systems budget is spent on network management across the sites interviewed, according to IDC. The average expenditure is $1.3 million per year for managing network domains.



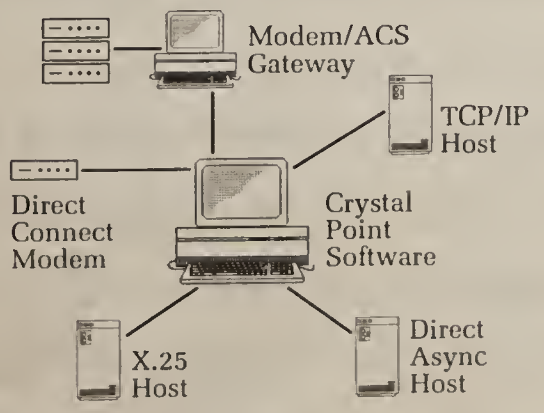
Keep it simple

Users of network management systems say the features that are most important to them are those that make life easier

Source: International Data Corp.

CW Chart: Guy Stuart

Your enterprise is complex. Your communications solution shouldn't be.



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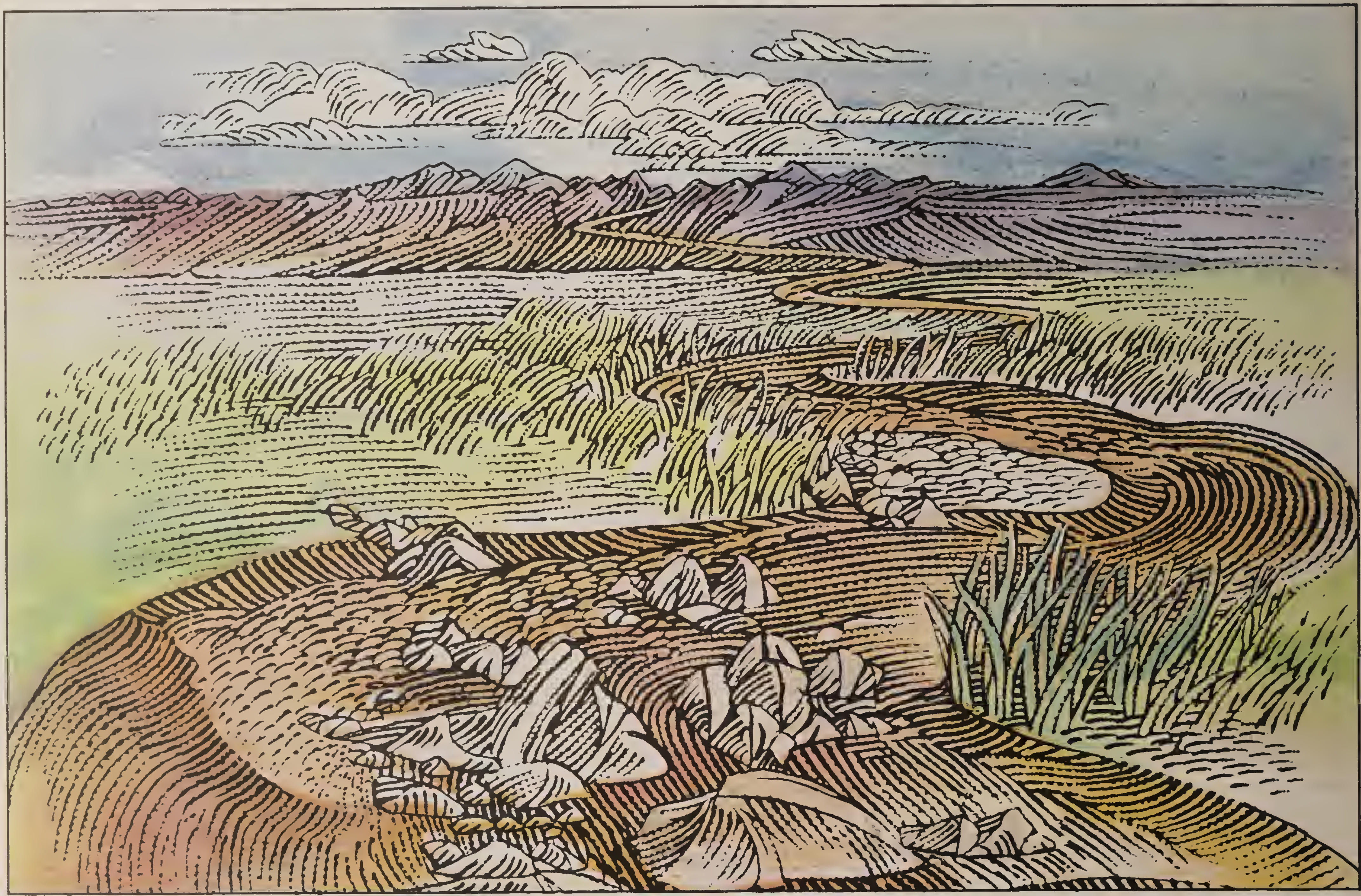
Before you migrate to
think about how



Without the right tools, migrating to a new e-mail system could be very bumpy.

Although downsizing from a host to a LAN-based e-mail system can indeed provide significant long-term savings as well as increased user productivity, it's just not going to happen that way if you have not planned for it carefully.

So how do you guard against this? Well, for one, make certain you choose a vendor who can provide a clear migration plan, along with the understanding that downsizing is a gradual process and not something that'll happen overnight.

Secondly, be sure they are in a position to offer you the right technology to meet your needs.

At Microsoft we're able to do all of this and a lot more. Take for instance our new transport-independent Microsoft® Mail Windows™ client. With it you can move your users to a

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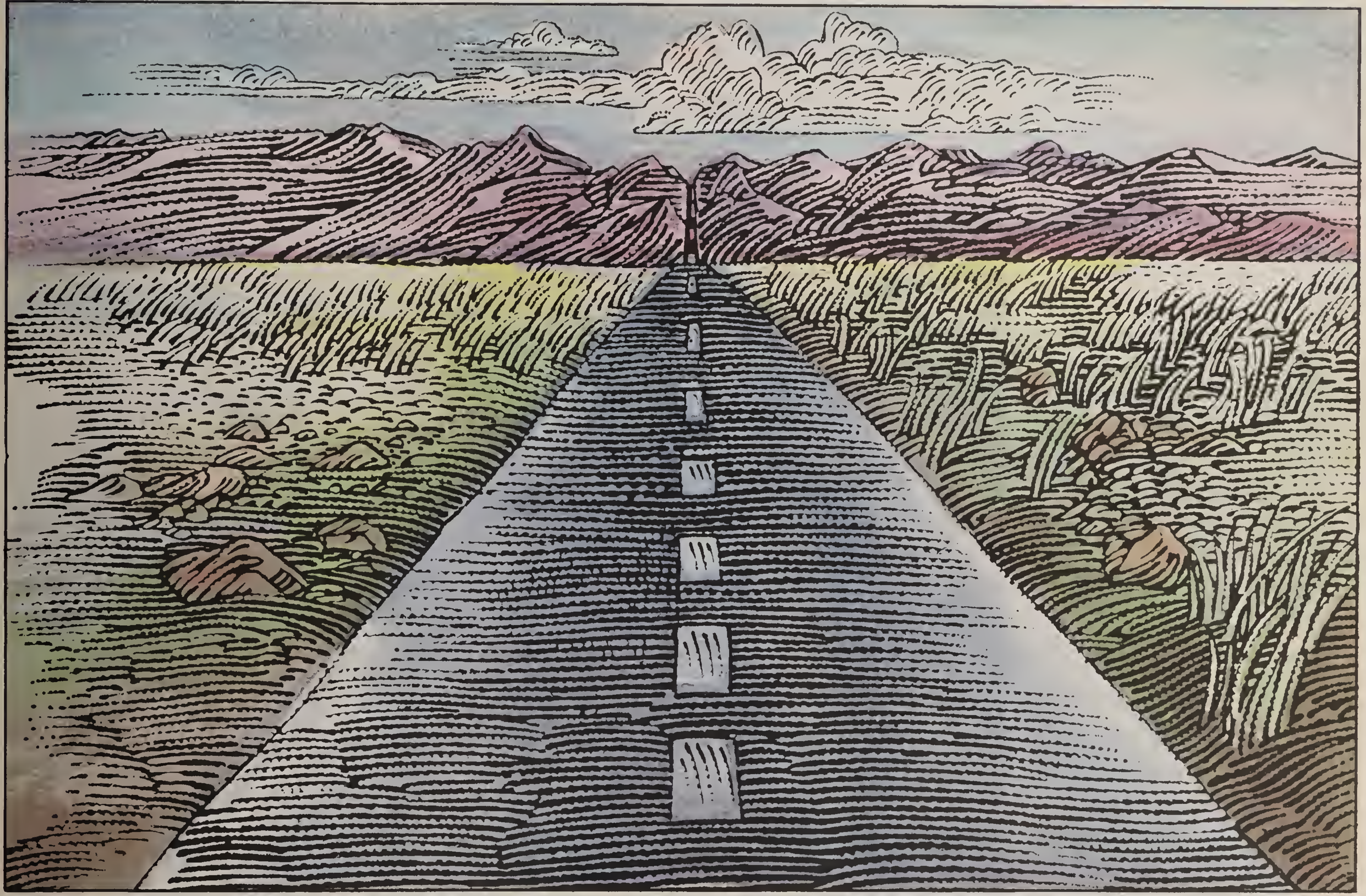

Making the switch with Microsoft Mail is guaranteed to provide a smooth ride.

single e-mail interface first, then migrate the back end when it's convenient for you.

Precisely what does all of this mean? Basically that you can move in manageable phases – phases that don't force you to change everything in one fell swoop.

For the details on our 3-phase migration plan, call us at (800) 227-4679, Department Z14, and ask for the Microsoft Electronic Messaging Strategy white paper and the Migration Solutions paper, too.

And put yourself on the road to a highly successful electronic mail strategy.

Call for your free copy of the Migration Solutions paper.

Microsoft
Making it easier

Vendors look for partners

CONTINUED FROM PAGE 51

The product works with Solve:Connect, which enables NonStop Net/Master to communicate with NetView in the IBM environment. Pricing starts at $9,620, and availability is scheduled for August.

Systems Center has had some success selling Net/Master software to vendors such as Tandem and Fujitsu Ltd., which want more full-function network management for their systems, as well as to companies such as AT&T and Digital Equipment Corp., which want their own network management platforms to be able to manage SNA.

However, Systems Center is also moving to become an integrated network management system vendor in its own right. A recently introduced product family called Solve, now being market tested in Europe, will provide a range of network management capabilities on either Net/Master or NetView, according to company spokeswoman Kathleen Janson.

Solve:LAN, introduced recently in the U.S., provides tools for managing local-area networks based on IBM's OS/2 Communications Manager and Microsoft Corp.'s LAN Manager.

On June 8, Systems Center plans to announce several new Solve products, including Solve:Change, for managing network changes; Solve:Problem, which formalizes and coordinates problem-solving procedures; and Solve:Configuration, which tracks what is on the physical network, Janson said.

However, Systems Center may be biting off more than it can chew by developing its own application suite for integrated network management, according to Passmore.

"If they are able to take these Solve: applications and figure out a way to migrate them to emerging industry standard platforms, [that] would be a good thing. But I'm not convinced people want to run everything on their mainframe and just depend on solutions from Systems Center," Passmore said.

A bouquet of applications

The following is a sample of third-party applications that now run on network management platforms:

For SunNet Manager 2.0:

- Information Presentation Technology's Apple AgentMan allows SunNet Manager to manage Apple Computer, Inc. AppleTalk networks.
- DeskTalk Systems, Inc.'s Data-Pipe SQL provides a database mangement system for storage, reporting and querying of management data. DeskTalk's Remote Monitoring Services Manager gathers data from Novell LANtern monitors, which monitor a variety of LAN protocols.
- Tivoli Systems, Inc.'s Wizdom provides object-oriented management of Unix systems.
- Packages from Chipcom Corp., 3Com Corp. and Cabletron Systems, Inc. allow SunNet Manager to manage the vendors' respective network devices.

For IBM's NetView/6000:

- Synoptics Communications, Inc.'s Lattis Views and Chipcom's OnDemand Network Control System now run on NetView/6000, enabling the platform to manage Chipcom and Synoptics hubs.
- Accugraph Corp. in El Paso, Texas, is providing applications that enable NetView/6000 to track data centers' cabling, software licensing and hardware configurations.
- Software from Bridgeway Corp. in Redmond, Wash., enables NetView/6000 to manage ASCII and asynchronous devices that do not comply with SNMP.
- Metrix Network Systems is providing IBM's platform with the ability to do LAN monitoring and protocol analysis using the SNMP Remote Network Monitoring protocol.

In addition, 3Com and Ungermann-Bass, Inc. announced that they would work with IBM to enable NetView/6000 to manage their products via SNMP.

ELISABETH HORWITT

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DIGITAL UPDATE

THE OPEN ADVANTAGE

MAY 1992

Open EDUCATION:

Training for a Multivendor World

Business plans for the '90s revolve around two **hot topics: expansion** or **restructuring.** You may have plans to **increase business,** to become a **key player** in a **multivendor, global market.** Or, you may be considering **streamlining your operation** through outsourcing, downsizing, or reskilling.

No matter what the plan, it will mean a **change** in the way you view **education** and **training.**

Digital's Education and Training Programs have evolved significantly in recent years to serve changing business trends, while maintaining quality traditional offerings, according to Pat Cataldo, Vice President of Digital's Education and Consulting Services.

Businesses working in multivendor environments need access to multivendor courses. Work forces need training or retraining on new product lines. Reskilling is becoming ever crucial in today's sluggish economy.

Here, Cataldo discusses these trends of the '90s — and the training solutions Digital provides.

Open Education Offerings Meet Multivendor Needs

Technological advancements in the workplace have led to changes in the dynamics of Digital's Education and Training Programs. "Our new focus on multivendor support allows you to choose one vendor to manage your complete training needs, regardless of the technology or application," Cataldo says.

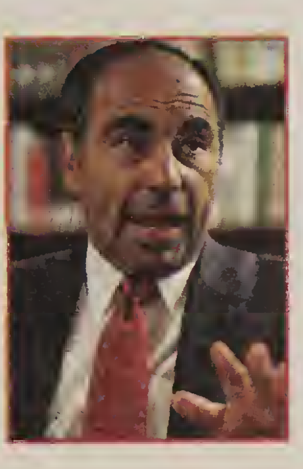
"More than a year ago, we took an aggressive look at the path that our Open Education services needed to follow," he continues. "We asked ourselves: 'What kind of services do customers want? What are our strengths and what can we provide?'"

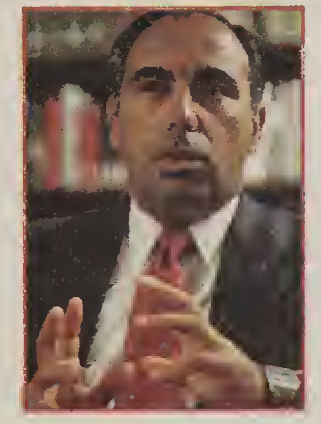
Cataldo offers this scenario to demonstrate the customer's dilemma when faced with a multivendor architecture: You've got a database, a PC network, and a suite of hardware and software products on the desktop — all from different vendors. How do you make it all work? To whom do you turn to for your training needs?

"Digital is better positioned than anyone to solve this complex customer situation," states Cataldo. "Not only do we offer industry-leading proprietary training, but we also offer the broadest range of education and training in non-Digital product areas."

In fact, a glance at the list of offerings at Digital's training centers shows this Open Education philosophy at work. A myriad of Digital-related technical course offerings are available, as well as courses dedicated to Lotus, Microsoft, WordPerfect, and others. "We continue to add to our base of multivendor products through signed agreements with ATI, CBT, Saratoga, Learn PC, and Hands On Learning," he explains.

"At present, we offer training on more than 90 different non-Digital products, and our portfolio of course offerings continues to expand. What's more, we have more than 100 international training centers — all of which position us as a true Open Education vendor in terms of end-user training."





Nontechnical Training: The Demand Increases

In the ever-demanding business environment, the race to keep up with technological advancements or the decision to streamline the work force creates a new set of challenges — challenges that focus on the human side of business.

"Businesses may be acquiring state-of-the-art equipment, but they are left with the problem of effectively implementing that equipment in the workplace," Cataldo explains. "Businesses that are downsizing need to implement new workstyles to compensate for those jobs that have been left vacant. Managers in each situation are looking for ways to implement change efficiently and cost-effectively.

> ***"Customers want the highest quality, job-relevant training at the most competitive price."***
>
> Pat Catalda
> Vice President
> Digital's Education and Consulting Services

"Digital provides the solution through a host of nontechnical training courses that deal with changing human dynamics in the workplace," Cataldo continues. "Our course offerings cover a wide range of topics including change management, time quality, and skills assessments, among many others."

Getting the Most for Your Money

Be it technical or nontechnical services, company training is made easier when customers are able to pick and choose the format through which they learn. Along with traditional on-site and classroom training, Digital offers a complete range of educational formats that includes books, audiotapes, videotapes, training from CDROM, interactive videodisks, customized multimedia programs, and satellite broadcasts.

"Customers want the highest quality, job-relevant training at the most competitive price," Cataldo states. "All of our course offerings, particularly our Unlimited Training Subscription package, give customers what they need to efficiently accomplish the jobs they are asked to do."

continued

Open Education continued

The Unlimited Training Subscription offers customers group rates for a full year of intensive training in applications design, development, management, and operations. "The subscription is popular with students because it gives them flexibility in the types of courses they take. No more working out a budget or getting permission to take each individual course," Cataldo explains. "Managers benefit from this comprehensive training plan because it involves one flat fee and little administrative work."

Digital Meets the Need for Reskilling Workers

One phase of Digital's Education and Training Programs is prompted, in part, by today's economy. To survive and prosper, companies are dealing with changes in their business strategy. Workforce reduction may be at hand. Those who remain on the job need to take on more roles. As a result, reskilling becomes crucial to a company's success.

"When you talk about reskilling, you're really talking about a customized training solution," Cataldo explains. "Digital has the resources to provide a training needs analysis for a company, and then customize and implement a reskilling program for them. It's an efficient and cost-effective route for businesses to take if they are thinking about reskilling their labor force."

Cataldo notes that reskilling also provides a crucial advantage to individual workers looking for employment.

"Recently, as a result of his company's restructure, an individual in the Boston area decided that reskilling was in his best interest. He started our technical training program in July 1991. By the end of November, he was employed in a new job requiring an entirely different set of skills from those of his former position," Cataldo says. "Although there is no guarantee of placement, students who complete our training programs are equipped with highly marketable skills in a number of areas not previously open to them."

Open Education Is the Key

With a growing menu of Digital-related courses, more than 90 non-Digital product courses, and a variety of non-technical offerings, Digital's Open Education curriculum is your best solution for keeping up with today's changing business trends.

Course Menu Sampling Serves Up Open EDUCATION

Digital's Education and Training Programs demonstrate our Open Education philosophy in the kinds of courses currently being offered. What follows is a selection of non-Digital product courses designed to assist you with your company's multivendor challenges.

- An Introduction to VMS for MS-DOS
- Teach Yourself WordPerfect
- Training for Quattro Pro V3
- Systems Network Architecture (SNA)
- Open Systems Interconnection (OSI)
- TCP/IP
- ANSI/C Fundamentals

Nontechnical Offerings Cover a Range of Topics

Our variety of nontechnical training courses assists you with improving individual and team efficiency and productivity. A sampling follows.

- Effective Presentations
- Coping with Stress
- Project Management Fundamentals
- Communication Skills
- Essentials of Negotiation
- Skills Assessment and Career Management

To register for or to get information on any Digital lecture/lab, course, or seminar, call 800-332-5656.

IT'S A FACT

VAXstation 4000 VLC SHATTERS the Workstation Myth

The real story behind Digital's VAXstation 4000 VLC may surprise you. In fact, you may not look at a VAXstation the same way again.

MYTH: VMS workstations are too expensive.

FACT: **VAXstation 4000 VLC prices start at just $3,450 — the first workstation in the industry to break the $3,500 price barrier.**

MYTH: Workstations are too big for the desktop.

FACT: **VAXstation 4000 VLC takes up no more room on your desktop than a PC or terminal, just 2¼ inches high, and measuring 15 inches by 14½ inches. Add a keyboard and a small monitor to complete the package.**

MYTH: You can't run your favorite applications on a workstation.

FACT: **VAXstation 4000 VLC can run any of the more than 6,500 VMS applications, including Lotus 1-2-3 and WordPerfect for VMS. What's more, by using DEC SoftPC, Digital's PC emulator, you have access to over 50,000 PC applications.**

MYTH: A workstation will decrease your VAX functionality.

FACT: **On the contrary, you increase your functionality and your productivity by gaining the use of windows and tools such as DECwrite and DECpresent.**

A Few More VLC Features

What else should you know about the VAXstation 4000 VLC? Built-in features include:

- 6.2 SPECmarks of processing power
- Standard 2D accelerated graphics for application enhancement
- High-performance I/O architecture
- Full NAS 250 software, including innovative ACA technology and DECwindows Motif.

VAXstation 4000 Model 60: Powerful Cousin of the VAXstation 4000 VLC

For more power, choose the VAXstation 4000 Model 60 with 12 SPECmarks of processing power. The Model 60 comes equipped with all the features of the VAXstation 4000 VLC — plus more expansion capabilities in the way of memory and options, including 3D graphics and the TURBOchannel open bus.

For high performance at your desktop, choose the VAXstation 4000 VLC or VAXstation 4000 Model 60.

Order Information

VAXstation 4000 VLC system (8 MB)
17-inch grayscale monitor (1024 x 768-72 Hz)
Order # PV31A-AD
$3,450

VAXstation 4000 VLC system (8 MB)
19-inch color Trinitron monitor (1280 x 1024-72 Hz)
Order # PV31A-CH
$6,750

VAXstation 4000 Model 60 system (8 MB)
17-inch grayscale monitor (4 plane 1280 x 1024-72 Hz)
Order # PV61A-8E
$5,995

VAXstation 4000 Model 60 system (8 MB)
19-inch color Trinitron monitor (1280 x 1024-66 Hz)
Order # PV61A-AH
$11,995

Note: These are examples of top-selling configurations. Other system configurations are available. All VAXstation workstations come with single-user VMS and NAS 250 licenses.

For information on these and other VAXstation 4000 configurations and options, call 800-DIGITAL (800-344-4825).

PARTNER SHIPS

Digital and Avnet Computer
TEAMWORK AT ITS BEST

In conversation with Rich Ward, Executive Vice President of Sales and Marketing for Avnet Computer, the word "partner" pops up frequently. He chooses this particular word to describe his company's 15-year relationship with Digital Equipment Corporation.

Headquartered in Culver City, California, and with branches across the United States and Canada, Avnet is Digital's first and largest distributor. But, even this description isn't suitable. Ward prefers to describe Avnet as an Information Technology Supplier — a company that is involved in designing system configurations and integration, as well as distribution.

Ward selects his words carefully, and so he should. Avnet is much more than a distributor of Digital's products. Its particular expertise and value-added services are what has kept customers satisfied — and what continues to strengthen Avnet/Digital ties.

Expertise on the Digital Line of Products

Avnet is on the way to selling its second billion dollars worth of Digital products and services. With this kind of experience and customer base, Avnet has assembled some of the industry's best sales professionals and technical engineering staff members to support the desktop to the data center. Avnet utilizes this core strength to support Digital's large Fortune 100 class customers — adding value primarily through complementary and flexible programs.

More than a supplier/ distributor alliance. Digital and Avnet are a winning combination.

"We certainly have expertise on the Digital product line," states Ward. "And we are second only to Digital in our ability to configure and design Digital systems. Our Systems Integration Unit is capable of doing all types of work without hesitation."

Ward emphasizes that his sales team — all of whom complete Digital's training program — is one of the best in the industry. "We know Digital inside and out," Ward says. "When Digital cannot provide service to a customer due to a time or cost factor, we can and do."

Three-Way Partnership Offers Solutions

With expertise in Digital's hardware technology and strategic relationships with software providers, Avnet is providing application solutions to the computer market. An example is the three-way partnership between Avnet, Digital, and Excalibur Technologies.

Excalibur Technologies has recently introduced a low-cost, entry-level, imaging, text and file retrieval system. Configured with Digital's RISC-based workstations, the system functionally replaces conventional file cabinets. The system is unique in terms of cost and in terms of its text-based technology.

"Basically, Digital and Avnet are taking a software product to market," Ward explains. "Digital has supported Excalibur in developing the product, and we are implementing a marketing plan. One package we'll be offering has the functionality and capability of competitive solutions priced in excess of $100,000. Our solutions will start at less than $40,000."

According to Ward, Avnet has also begun to form partnerships with value-added resellers (VARs) so that customers are assured of constant and consistent service.

Added Value Means Customer Satisfaction

"Installed-base customers are looking for efficient and cost-effective ways to add on to or upgrade their systems. They are also looking for service. We provide all that and more," says Ward.

To that end, Avnet offers services which include:

- **System Evaluation**
  Providing information you need in order to take full advantage of your system's capabilities
- **On-Site Demo Capabilities**
  Giving you a first-hand look at how new products can improve system performance
- **Systems Engineering Group**
  Improving the high standard of technical support already in place for you
- **Proposal Center**
  Providing you with all the financial and technical information you need to make a decision on system add-on or upgrade purchases
- **Literature Center**
  Offering you a centralized portfolio of manufacturers' literature
- **Two Hotlines**
  Open 11 hours a day for technical questions or problems.

Avnet Philosophy: Putting Your Needs First

"We have some unique services at Avnet that clearly demonstrate our 'customer first' message," says Ward. He talks about Bob Gracz. Although he is an Avnet employee, Gracz is an insider who represents you. His job is to listen to your complaints, investigate the root causes of those complaints, and find solutions. "This grass-roots approach to customer satisfaction gets customers the help they need immediately," says Ward.

A toll-free line will also be in place in the near future to give you access to key staff should you be dissatisfied in any way with Avnet's service.

Truly a Digital partner, Avnet Computer offers you a strong complement of systems integration expertise and value-added service. What's more, the Avnet/Digital team can provide complete solutions for your business challenges.

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If you're in the market for repairs, head to a Digital Carry-In SERVICenter near you. With a service menu consisting of more than 10,000 computer products from more than 1,000 vendors, your SERVICenter offers quality work at a quality price.

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You want all the benefits of a corporate structured library at the departmental level — and at an affordable price. Now you can get it with the Team Document Library Solution from Digital and Information Dimensions, Inc.

Incorporating software, installation, and customization services, the Team Document Library Solution enables your workgroup to organize, manage, and share dynamic document information, within an easy-to-use electronic library. The result? Major improvements in overall workgroup productivity. Key solution features include:

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- Content-based retrieval for fast access to information
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What's more, your PC- and Macintosh-based workgroups can continue to use their familiar desktop computing resources.

For more information, call 800-DIGITAL (800-344-4825), ext. 157.

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Printing's Dynamic Duo: ALL-IN-1 V3.0 and DECprint Printing Services for VMS V4.1

Upgrade to Digital's ALL-IN-1 V3.0 and you'll combine the world's leading office automation system with the many value-added printing capabilities of DECprint Printing Services for VMS V4.1. With ALL-IN-1 V3.0, you have complete access to DECprint Printing Services for VMS capabilities, including:

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Price varies with type of system.

DECprint Printing Services for VMS V4.1
Order # QL-YNCA9-AA/APZ
$1,300
Media and Documentation
Order # QA-YNCAA-H*/APZ
$365

*Using TK50, replace * with 5. Using tape, replace * with M.*

Commonly Used VMS Printing Parameters for PostScript Printers

To Do This Task...	Use These Parameters...	With These Qualifiers	For Example...
Print different types of data, such as PostScript files.	DATA_TYPE	ANSI DDIF PCL POSTSCRIPT REGIS TEK4010	PRINT/QUEUE=queuename/PARAM=DATA_TYPE=ANSI filename
Print documents on PostScript printers with DEClaser or LN03 font cartridges.	FONTS_USED	See the DECprint Printing Services User Guide.	PRINT/QUEUE=queuename/PARAM=FONTS_USED=CGTIMES8-10-12 filename
Specify input tray.	INPUT_TRAY	TOP MIDDLE BOTTOM	PRINT/QUEUE=queuename/PARAM=INPUT_TRAY=TOP filename
Print one or more pages per side.	NUMBER_UP	0-100	PRINT/QUEUE=queuename/PARAM=NUMBER_UP=4 filename
Specify output tray.	OUTPUT_TRAY	TOP or UPPER SIDE or LOWER FACE_UP	PRINT/QUEUE=queuename/PARAM=OUTPUT_TRAY=TOP filename
Determine first and last pages to print.	PAGE_LIMIT	1-10000	PRINT/QUEUE=queuename/PARAM="PAGE_LIMIT=(2,8)" filename
Print vertically or horizontally.	PAGE_ORIENTATION	PORTRAIT LANDSCAPE	PRINT/QUEUE=queuename/PARAM=PAGE_ORIENT=PORTRAIT filename
Print copies of each page.	SHEET_COUNT	1-10000	PRINT/QUEUE=queuename/PARAM=SHEET_COUNT=3 filename
Specify the sheet size.	SHEET_SIZE	LETTER A A3 A4 A5 LEDGER B B4 B5 EXECUTIVE LEGAL	PRINT/QUEUE=queuename/PARAM=SHEET_SIZE=LEGAL filename
Print pages on one or two sides.	SIDES	1 2 TUMBLE	PRINT/QUEUE=queuename/PARAM=SIDES=2 filename
Use more than one parameter.	Use up to 8 parameters separated by commas, enclosed in parentheses.	See the qualifiers available for the parameter.	PRINT/QUEUE=queuename/PARAM=(PAGE_ORIENT=LANDSCAPE,SIDES=2) filename

DEC Image Print-PLUS Boosts *turbo* PrintServer 20 Performance

If you're using a *turbo* PrintServer 20 networked printer, Digital's got news for you. Now, you can print images at speeds of up to 20 pages per minute with DEC Image Print-PLUS software.

Our new software product lets you submit print requests for compressed bitonal image files in Digital Document Interchange Format (DDIF) from anywhere on your printer's network. What's more, DEC Image Print-PLUS software retains the PostScript and ANSI printing capabilities that are standard on the *turbo* PrintServer 20.

DEC Image Print-PLUS is compatible with existing PrintServer software and conforms to existing PrintServer management and control functions — making it easy to use and manage. Adding to its features, DEC Image Print-PLUS:

- Supports CCITT G3 and G4 compression
- Employs hardware-assisted image decompression
- Prints single- or double-sided copy
- Prints multiple paper sizes: A, A3, A4, legal, and B
- Prints multiple-page image files
- Supports rotation, cropping, and scaling of images.

Give your *turbo* PrintServer 20 a power boost with DEC Image Print-PLUS software today.

Order Information

DEC Image Print-PLUS software
Order # FW-IPPL9-AA
$3,500

To order or for more information on ALL-IN-1 V3.0, DECprint Printing Services for VMS V4.1, or DEC Image Print-PLUS software, call 800-DIGITAL (800-344-4825), ext. 494.

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Ethernet provides low-cost links to FDDI

BY JOANIE M. WEXLER
CW STAFF

BILLERICA, Mass. — A soaring number of on-line transactions prompted Harte-Hankes Data Technologies to install a high-speed backbone switch from Synernetics, Inc. last month.

The LANplex 5012 from Harte-Hanks' Billerica neighbor allows the database quality-assurance service to eliminate manual tape backup operations, interconnect multiple computing platforms and generally speed delivery time to customers, said Dick Man, vice president of product support.

Harte-Hanks, a subsidiary of San Antonio-based publisher Harte-Hanks Communications, Inc., is in business to streamline databases for banking, insurance and retail clients such as Chemical Banking Corp., John Hancock Life Insurance Co. and Federated Department Stores, Inc.

Homegrown software merges multiple entries of names and addresses that have made their way into a client's database and then consolidates data into purchasing summaries to allow client firms' marketing executives to better analyze demographics and buying trends.

The firm handles 150 databases from major companies in the three industries along with other smaller jobs, Man said. He estimated a typical banking customer has 5G to 6G bytes of data stored on Harte-Hanks' Amdahl Corp. 5890 300E at anytime.

Harte-Hanks chose the Ethernet-to-Fiber Distributed Data Interface (FDDI) switching hub from Synernetics because burgeoning volumes of data demanded a high-speed, on-line networking capability between its mainframe and its personal computers and workstations, where the cleaned-up databases are formatted for customers.

"We needed a reliable way of passing data without an operator having to mount any tapes on PCs and workstations," Man explained.

Harte-Hanks more than doubled its customer accounts from 1990 to 1991 (see chart), and the firm continues to gather new clients with more entries to be processed. And clients are expecting delivery of their manipulated database tapes more frequently to refresh their marketing efforts, Man said.

Synernetics' FDDI-in-a-box technology is one in a new generation of "switching hubs" that are emerging to migrate users from existing local-area networks to next-generation LANs. The Synernetics hub is somewhat of a cross between an Ethernet-to-Ethernet switch from Kalpana, Inc. in San Jose, Calif., and an FDDI-to-FDDI switch demonstrated by Digital Equipment Corp. at its DECworld '92 show in Boston this month.

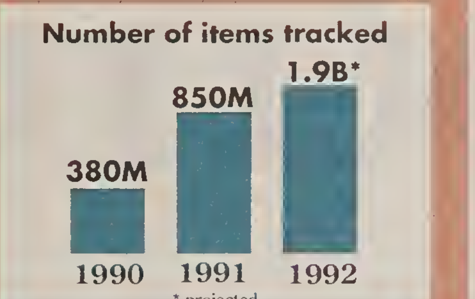
ON SITE

Harte-Hanks Data Technologies

Billerica, Mass.

- **Challenge:** To speed the delivery of a burgeoning volume of manipulated databases to clients while moving to unmanned operations.
- **Key product:** LANplex Ethernet-to-FDDI switch from Synernetics, Inc. in Billerica.

Number of items tracked



* projected

Synernetics' LANplex 5012 allows Harte-Hanks to capitalize on FDDI's 100M bit/sec. speeds without bearing the brunt of FDDI connection costs for every workstation on the network, Man explained. This is because the mainframe, workstations and Unix file servers sport low-cost 10Base-T Ethernet connections rather than high-priced FDDI links. The mainframe connects to the LANplex through channel-attached gateways and to other computers or lightly populated 10Base-Ts connect via smart wiring hubs.

The LANplex donates to each computing resource the full 10M bit/sec. of Ethernet bandwidth, bridged over three internal 100M bit/sec. FDDI backbones logically configured inside the LANplex box.

Prior to installing the LANplex, mainframe-formatted data would be backed up to a nine-track tape, then manually restored onto a PC or workstation.

"With LANplex, together with TCP/IP software, we now have on-line network connections and no longer use nine-track tapes," Man said. "It used to be very labor-intensive to load them. Now we don't require any operator intervention at the workstation or PC."

An alternative would be to install fiber cabling and relatively high-price FDDI connections. Harte-Hanks also evaluated FDDI technology from Fibronics International, Inc. in Hyannis, Mass., but found the "price/performance of the LANplex far superior," Man said.

Bridge savings

Ethernet-to-FDDI bridges from Fibronics would have cost the company about $10,000 per port, compared with just over $3,000 per port with the LANplex, Man said. In addition, the Synernetics box was able to expand to accommodate more LAN segments than Fibronics devices — important to Harte-Hanks, which is installing growing numbers of X terminals to allow technical analysts to access the Amdahl and Unix computers simultaneously.

Man estimated that LANplex has already cut a day off customer turnaround time. He said he expects more streamlining when the firm has more experience with the product.

The migratory FDDI approach was attractive, Man said, because "we want to learn the behavior of the network before we optimize it for FDDI."

Retix, ACC announce new routers for LANs

BY JOANIE M. WEXLER
CW STAFF

Router vendors are continuing to tweak their products to unclog internetworks and to allow local-area networks to operate at near-full-bandwidth speeds.

Announcements this month from Retix and Advanced Computer Communications, Inc. (ACC) address the growing need for "separate but equal" processing of multiple protocols in routed LAN internetworks.

For example, Santa Monica, Calif.-based Retix announced a reduced instruction set computing (RISC)-based router that designates a specific processor for each protocol type, rather than requiring that all protocols contend for one chip's processing power.

Meanwhile, ACC, based in Cupertino, Calif., outfitted its bridge/routers with a fair-queuing mechanism designed to even out the bandwidth availability across wide-area links. ACC's goal is to prevent, for example, users who are "browsing" through a remote database from suddenly bumping others off-line for several minutes because they have decided to download a huge file.

The Retix and ACC approaches differ in that the Retix announcement is geared toward beefing up the throughput of the router. The ACC enhancement to its Series 4000 devices apportions bandwidth based on a feature that remembers who has sent packets recently, then divvies up bandwidth on a first-come, first-served basis.

Retix designed its architecture around multiple Intel Corp. I960 processors. The $9,200-and-up RouterExchange 7000, slated to ship in the third quarter, is said to treat all protocols equally efficiently.

"Retix is going along with what many hub and router vendors are doing to improve performance without requiring users to upgrade to FDDI," said Jennifer Pigg, program manager of data communications at Boston-based consultancy The Yankee Group.

"If I had a RISC-based LAN with signals being transmitted and received at the same time, it would be like filling up a pipeline with a double shot," said Glenn Grace, computer information consultant at the Washington state Department of Ecology in Olympia. The department currently uses Retix's 4900 series of bridge/routers.

Grace said he may require enhanced router performance within two years because of new geographical information system applications coming down the road.

LAN-to-ATM connection

Retix has also outfitted its new router with an interface to Asynchronous Transfer Mode (ATM) cell-relay switches, which would ultimately allow LANs to link to ATM wide-area networks, according to Randy Phillips, vice president and general manager of Retix's internetworking products unit.

While Phillips declined to say whose ATM technology the firm used in its interface, he did say Retix will soon demonstrate compatibility with ATM switches from Adaptive Corp., a Redwood City, Calif., subsidiary of Network Equipment Technologies, Inc., and Fore Systems, Inc. in Pittsburgh.

The bandwidth-hogging problem addressed by ACC's software is one that Oracle Corp. — which will soon test the product — experiences at some of its low-speed international sites, said Jack Haverty, internet architect at the Redwood Shores, Calif.-based database company.

Haverty explained that many router vendors currently offer mechanisms for assigning a high- or low-priority queue to each protocol to be routed.

However, the protocol-to-queue matching "is not attractive long-term, because in client/server computing, your interactive and bulk traffic is mixed within the same session. How do you pick which queue to assign your traffic to?"

Haverty described the ACC enhancement as a "refreshing approach," though how well the technology works will be the true test, he said.

AT&T adds long-distance fraud protection program

BY ELLIS BOOKER
CW STAFF

CHICAGO — Seeking to curb some of the estimated $1 billion worth of long-distance toll fraud annually, AT&T recently introduced NetProtect, a family of products and services designed to detect and recompense customers whose telecommunication services are compromised.

With NetProtect Basic Service, which is offered at no additional cost to AT&T long-distance and 800-number customers, AT&T will monitor calling patterns to spot fraud and alert customers. Monitoring of AT&T 800 lines began last week, and monitoring of international long-distance patterns to some countries will begin Aug. 1.

Other options in the plan include the following:

- Enhanced Service, which provides more customized monitoring and a $25,000 per incident/per location limit on the customer's financial liability.
- Premium Service, which reduces customers' financial liability to zero, providing they follow AT&T's private branch exchange (PBX) and security recommendations.

Other options include a fraud detection service for AT&T's Software Defined Network, a consulting service, Hacker Tracker software for AT&T PBXs, a real-time service for detecting and stopping toll fraud while it is in progress and a handbook with technical documentation and tailored training for preventing fraud on AT&T PBX and voice-mail systems.

Sprint Corp. recently announced a similar service.

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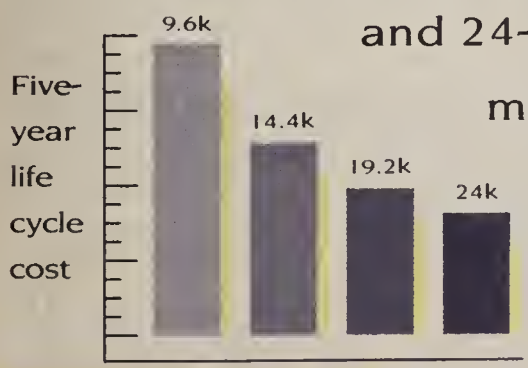

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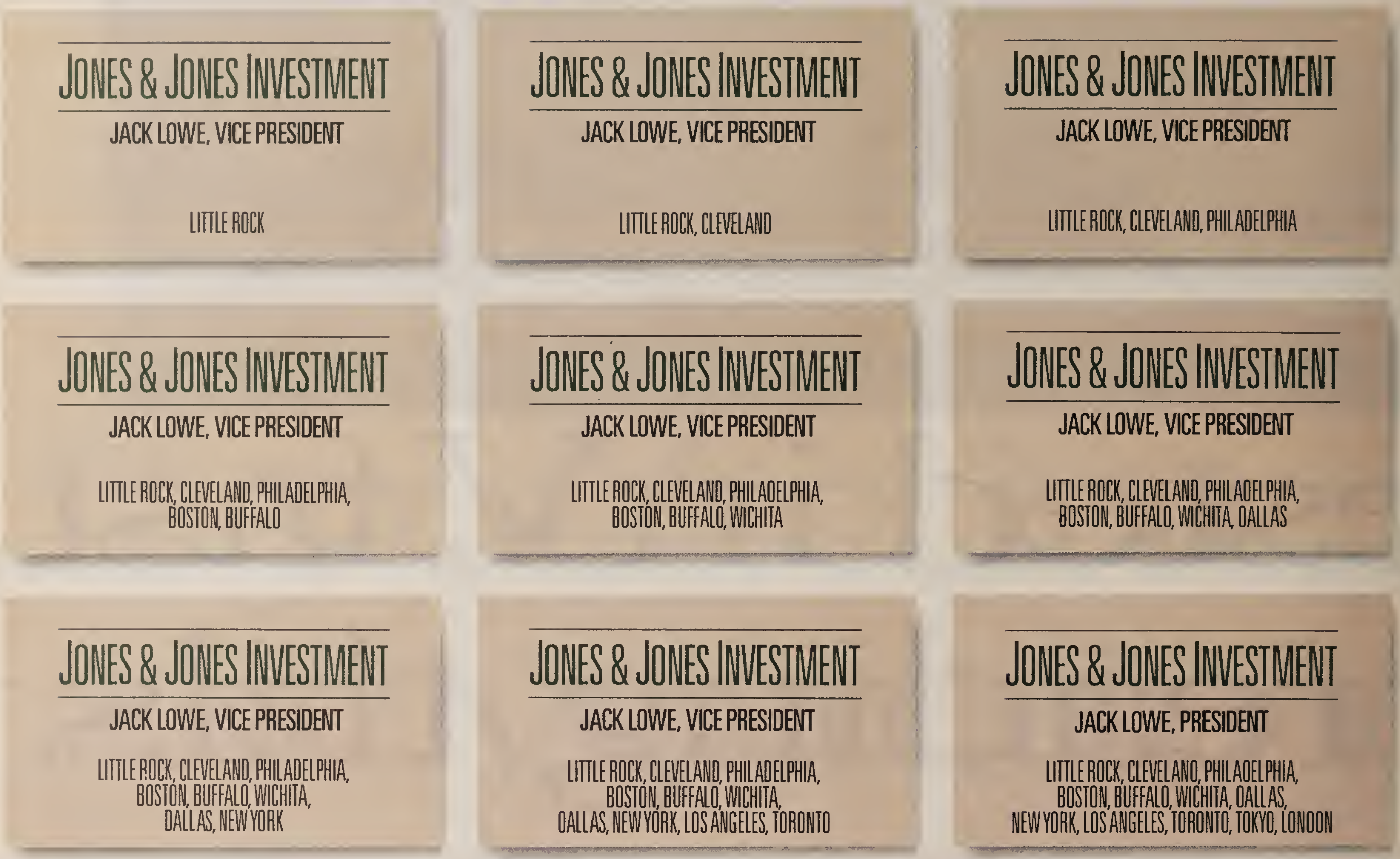
Fax# 508-261-1204.



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Lotus cc:Mail

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NEW PRODUCTS

Network management

Trellis Software, Inc. has announced an upgrade to its Expose Network Manager for Banyan Systems, Inc.'s Vines.

Expose 1.3 is a server-based management product. It collects diagnostic information on 90 areas of network performance, the company reported. Expose Network Manager 1.3 costs $1,495 per server license. Upgrades for registered users are free.

The company also has two complementary products for smaller Vines networks: ExposeDraw and Network Observer.

Trellis
85 Main St.
Hopkinton, Mass. 01748
(508) 435-3066

Horizons Technology, Inc. has developed LAN Auditor 2.1, an update of its network inventory and configuration management software.

The new version audits software applications and version numbers on the network in addition to hardware. It can be set to conduct unattended audits at specified intervals. Version 2.1 also includes a more graphical interface and support for the Clipboard under Microsoft Corp.'s Windows.

The price is $495 for the first 50 network nodes monitored, plus $395 for each additional 100 workstations monitored.

Horizons Technology
3990 Ruffin Road
San Diego, Calif. 92123
(619) 292-8320

Gateways, bridges, routers

Network Equipment Technologies, Inc. (NET) has announced the NET Ethernet Bridge Option, a software product for the company's NET SPX Intelligent Statistical Multiplexers.

The product connects local-area networks using established wide-area network links, eliminating the need for external routers, according to NET. It also supports terminal-to-host connections and a variety of LAN protocols, including Transmission Control Protocol/Internet Protocol, Local-Area Transport and Novell, Inc.'s IPX.

The NET Ethernet Bridge Option can be configured as a learning bridge to automatically build an Ethernet address table.

The product is priced at $995. A site license costs $2,895.

NET
800 Saginaw Drive
Redwood City, Calif. 94063
(415) 366-4400

IDEAssociates, Inc. has announced version 1.2.3 of the IDEA Concert Communication Processor, allowing multihost access over installed local-area networks.

IDEA Concert can now carry IBM Systems Network Architecture data traffic over an installed Ethernet or Token Ring LAN. Users can run standard 3270 and 5250 emulations to IBM mainframes and midrange systems.

Pricing for IDEA Concert runs from $2,995 (with suppport for four devices) to $21,965 (for 96 devices).

IDEAssociates
29 Dunham Road
Billerica, Mass. 01821
(508) 663-6878

Raycom Systems, Inc. has designed a Source Routing Transparent bridge, the Model 3440SRT Local Token Ring Bridge.

The product simultaneously performs source routing and transparent functions, allowing users to mix source-routing hosts with other devices on a single Token Ring local-area network without degrading network performance. In transparent mode, the bridge can handle up to 1,000 device addresses.

The stand-alone version costs $5,200; a version with a fiber-optic extender is priced at $5,800.

Raycom Systems
16525 Sherman Way, #C-8
Van Nuys, Calif. 91406
(818) 909-4186

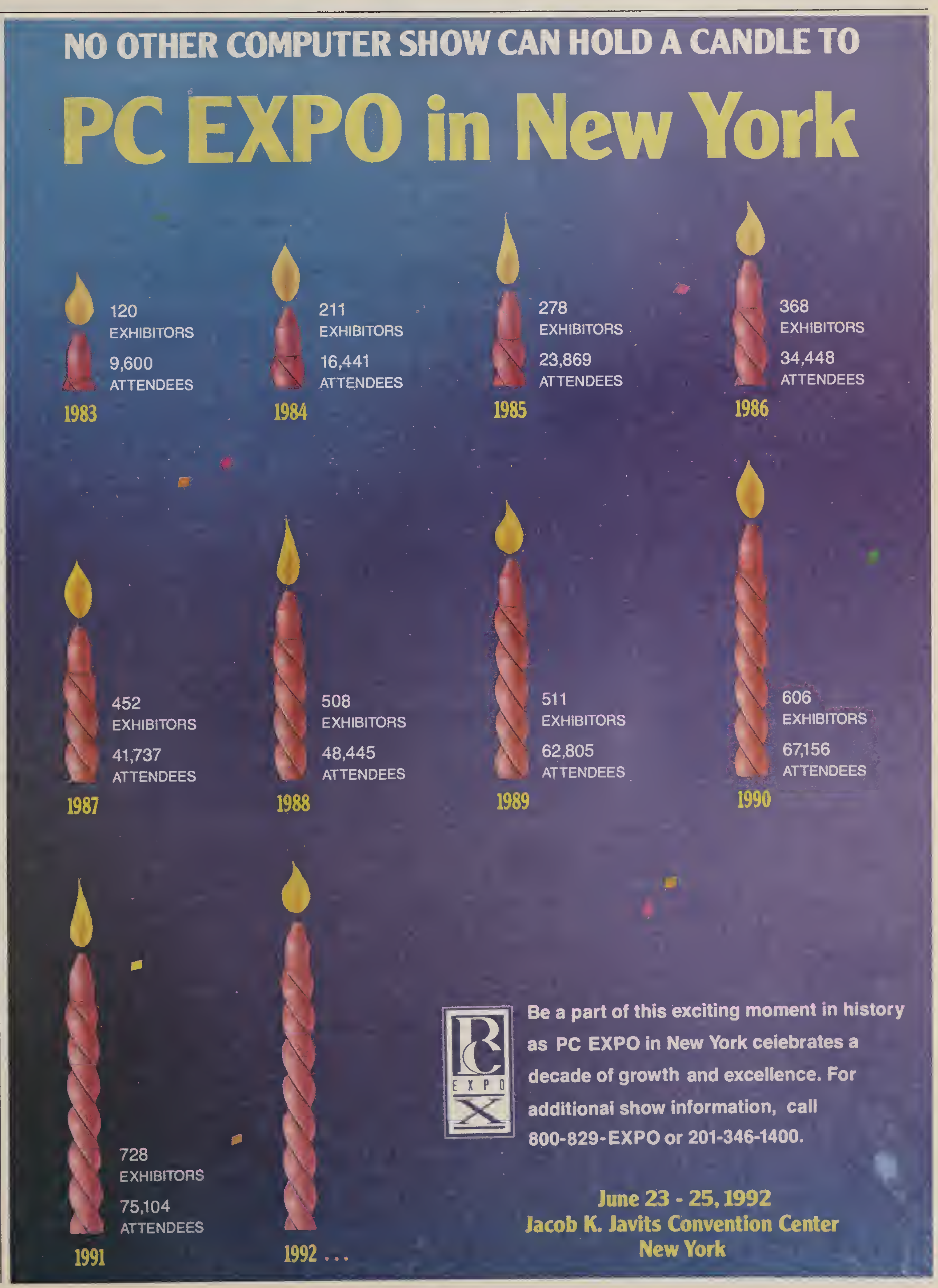
Customer-premises equipment

Gandalf Systems Corp. has introduced a line of Integrated Services Digital Network (ISDN) gateways with inverse multiplexer capabilities.

The Gandalf Access SDX ISDN gateways allow users to establish high-capacity connections by using multiple 64K bit/sec. ISDN B channels. High-bandwidth applications such as videoconferencing are supported.

A 64-channel system costs $12,000.

Gandalf Systems
Cherry Hill Industrial Center - 9
Cherry Hill, N.J. 08003
(609) 424-9400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Page 99

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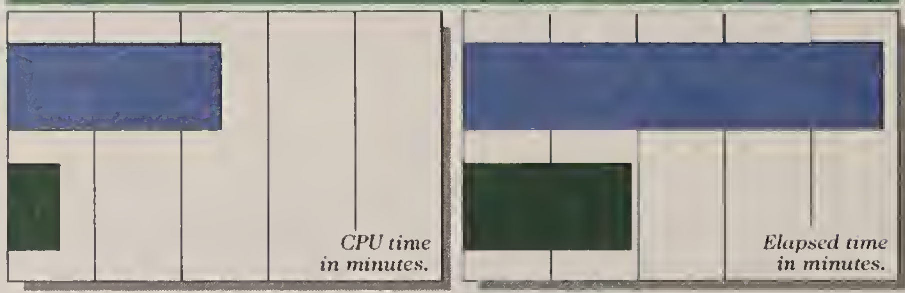
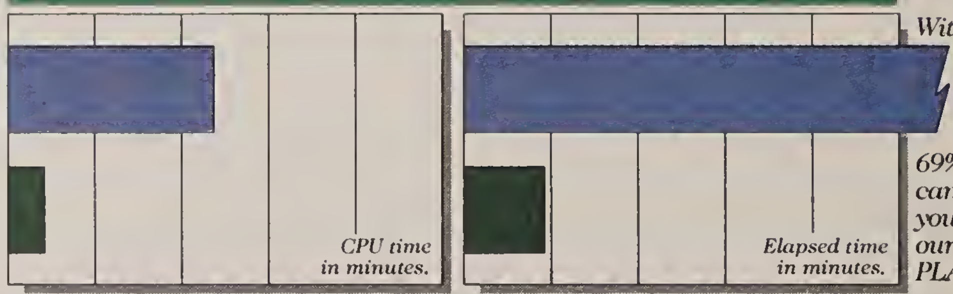
On a 67,700 page tablespace, PLATINUM Rapid Reorg used 3.34 minutes of CPU time compared to 12.68 minutes for the IBM REORG utility. That's a 73% CPU time savings with PLATINUM.



PLATINUM Rapid Reorg's run of 9.57 minutes was 158% faster than IBM's 24.72 minute result. Running PLATINUM also improved EXCP performance. Our run used 35,282 while IBM consumed 54,000.

PLATINUM *Fast Load*™ vs. DB2 V2.3 LOAD Utility

On the same 67,700 page tablespace, PLATINUM Fast Load used 2.82 minutes of CPU time compared to 12.58 minutes for the IBM LOAD utility. That's a 78% CPU time savings with PLATINUM.



With performance nine times faster than IBM LOAD (4.82 minutes vs. an off-the-chart 43.45 minutes) and 69% fewer EXCPs, all we can say is, "Wait until you see the numbers for our soon-to-be-released PLATINUM Fast Unload."

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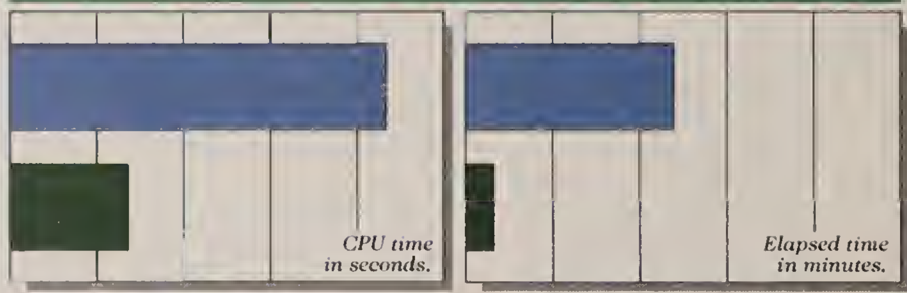

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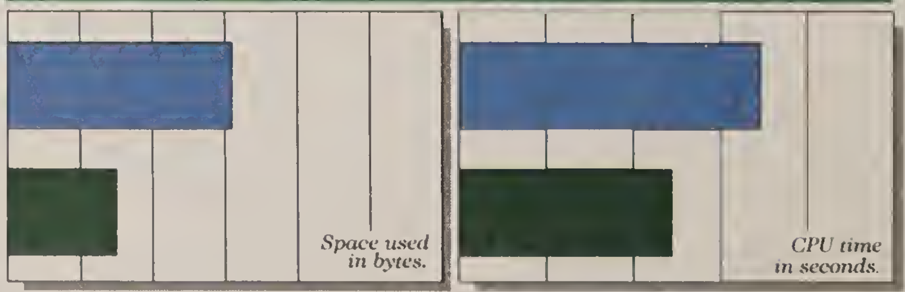

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Trials run using DB2 V2.3 General Availability release of 10/24/91. *DSNSHUFF, provided as source code with DB2 V2.3

IN BRIEF

Sequent, CA team up

■ **Sequent Computer Systems, Inc.** will provide **Computer Associates International, Inc.**'s mainframe software for systems management, business applications and information management on Sequent's Symmetry 2000 on-line transaction processing-based systems. The partnership also calls for joint development and marketing of CA's CA-Unicenter, CA-DB, CA-DB:Generator and CA-Classic/Open software applications. The agreement allows Sequent to offer CA's Unix-based software products on its open systems-based symmetric multiprocessing (SMP) platforms. In addition, the deal calls for Sequent and CA to jointly develop an enhanced version of CA's CA-DB for Sequent's Dynix-ptx SMP operating system. Both companies expect all software products to be available for general release by the second quarter of 1993.

■ A unit of **Bull HN Information Systems, Inc.** released a product that consolidates existing voice processing systems equipment and speeds customer service queries. Operational Support System Integration Architecture, or OSS-IA, is targeted at large phone companies. Pricing starts at $100,000.

Data centers do good by recycling well

Firms reduce expenses by recycling everything from tape reels, toner cartridges to aluminum cans

BY JOHANNA AMBROSIO
CW STAFF

It seems to be a perfect business axiom for the 1990s: doing well by doing good. Some companies have discovered that one way to accomplish this is with an aggressive recycling program in the data center.

Equitable Real Estate Investment Management, Inc., an Atlanta-based subsidiary of The Equitable, began its recycling program five years ago, according to Jayna Whiddon, data center coordinator. The company recycles paper, tape reels, microfiche masters, laser printer toner cartridges and aluminum cans. The company uses the money made from this program to fund parties and incentive awards and to buy soda for data center employees.

This kind of commitment is a step beyond what many companies are already doing: recycling paper and aluminum cans throughout the organization, which requires all employees to take part but does not include any data center-specific kinds of items. The companywide programs are typically run by a general services group out of corporate headquarters.

In contrast, a data center-specific recycling program usually needs someone in the data center or technical services group to get the program started and to be a point of contact for the corporate services group.

Other companies with aggressive recycling programs include The Travelers Insurance Co. in Hartford, Conn., and Wal-Mart Stores, Inc. in Bentonville, Ark., according to Tom Blanton, executive director at OpsTech, an Atlanta consulting firm.

"The bigger the company and the more they recycle, the more benefits they realize," Blanton said. "Once the programs get going, they pretty much manage themselves."

But a company does not have to be large to yield bottom-line benefits. The 1,000-employee Equitable Real Estate is realizing significant savings from recycling 400 to 500 of its laser cartridges each year. "We save money, reduce landfill, and we get a better product for less money," Whiddon said.

A new laser cartridge costs between $85 and $125. In comparison, a long-life cartridge goes for $69, and each refill costs around $47. One cartridge can generally be refilled about six times because the manufacturers put in long-life drums.

Additionally, the recycled cartridges yield more copies and higher quality than their nonrecycled counterparts, Whiddon said.

Better, quicker, faster

A new laser cartridge generally has to run 200 or so pages before the toner kicks in full-speed and the print is crisp and clear. With the long-life cartridges, this process takes place once, and, on each of the subsequent six refills, the cartridge is already broken in.

Recycled cartridges also have more toner, so they produce about twice the number of pages than do nonrecycled cartridges.

Whiddon said Equitable Real Estate makes more than $1,000 a year from selling the paper that the data center uses. Other money is raised by recycling soda cans; these funds are used to purchase more soda for data center employees. Tape reels are recycled by turning the tape around so the end of the tape is now the beginning; this doubles

Continued on page 67

CA pricing revamp gets mixed response

BY THOMAS HOFFMAN
CW STAFF

ISLANDIA, N.Y. — One month after Computer Associates International, Inc. revealed pricing structure changes, users have had a chance to digest the announcement. Their response is mixed, although generally positive.

Seven out of 10 CA users interviewed were receptive to the pricing changes, which they said will help them plot their software strategies better in the near term. In addition, users responding favorably to those changes said the new pricing structure is indicative of CA's improved flexibility.

Edward J. Skiko, vice president of corporate information technology at General Electric Co. in Stamford, Conn., which recently signed an enterprisewide mainframe software licensing agreement with CA, said the new pricing changes provide "flexibility in the software licensing process, simplicity in software selection and stabilization of software costs."

Pricing skeptics

However, not everyone was thrilled by the new pricing structure. "I'm not overwhelmed by the economics of" the pricing changes, said Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. Loane, whose firm uses CA's IDMS, Librarian, Tape Management and TopSecret software, is particularly disheartened by CA's new maintenance savings plan. Under the plan, users who pay a onetime subscription fee, which is 30% of the current list program price, can reduce their annual maintenance fees by up to 40%. Loane does not want to be charged up front to "freeze" maintenance pricing.

In addition, Loane said he felt unfavorable toward CA's announcement that software pricing would be raised by no more than 5% this year. "That's nice," Loane said. "I'd like to see them increase functionality by 5% and maintain pricing."

The Information Users Association (IUA), an independent CA user group, was reportedly instrumental in prompting CA to adopt new pricing strategies while addressing the concerns of

Continued on page 66

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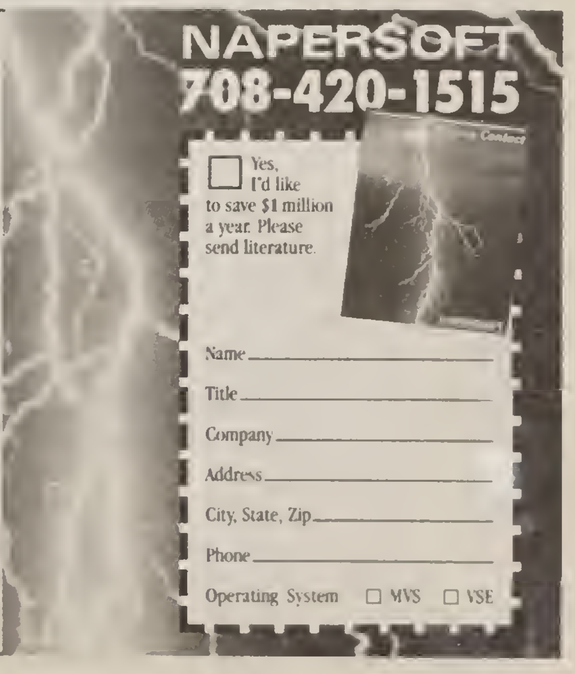

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HP launches mail-order minis

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — A takeoff on mail order is taking root in the minicomputer business at Hewlett-Packard Co., which is using it to increase sales to resellers.

HP recently said it is launching the Quick Ship program for its HP 9000 Series 800, aimed at making certain models available within seven business days rather than one to two months.

Quick Ship is aimed at resellers, but end users will also be able to make purchases, said Lenny Rosenthal, Series 800 product line manager.

The program comes as HP continues to add distributors, value-added resellers and value-added dealers to its Series 800 team. The company has tapped Ingram Micro, Inc., Hallmark Electronics Corp., The Ultimate Corp., MAI Systems Corp. and Arrow Electronics, Inc. over the last 18 months and is expected to sign another large distributor later this month. HP is trying to increase the mix of Series 800 indirect sales from 25% to 50% during the next two to three years, Rosenthal said.

The Quick Ship program is less extensive than classic personal computer mail-order operations because it does not permit flexibility in system configurations.

HP is designating its four lowest end Series 800 configurations for availability through 800-number phone orders. Orders are then sent to HP's Roseville, Calif., manufacturing facility, where they jump to the top of the assembly queue.

The 12-member Series 800 line is HP's Unix-based, multiuser minicomputer family, built on the company's Precision Architecture microprocessor.

The four machines available in the Quick Ship program are the 8-user Model 807, the 16-user 817, the 32-user 827 and the 48-user 827. They are priced at $17,977, $34,378, $47,583 and $59,743, respectively.

CA pricing gets mixed response

CONTINUED FROM PAGE 65

CA users to improve customer service support.

IUA board member George Emmanuel said he went to IUA's spring conference in Dallas last month "terrified" about how CA executives would respond to IUA membership concerns for improved pricing and customer service support. "We were afraid that they'd throw us out of the room," Emmanuel said. "I was shocked by how [favorably] CA reacted."

Emmanuel, a senior partner at Emmanuel & Farr, a Laguna Nigel, Calif., IDMS service company, said vendors such as CA are being forced to change their policies as the use of information technology shifts from centralized data use to distributed computing and client/server environments. "Vendors like CA have to wrestle with the fact that this is going to be a brand new world, and it's either change or die," Emmanuel said.

Listening to customers

CA acknowledged that it had to become more responsive to its customers with regard to changes in its pricing and customer service support structure, a problem that the $1.4 billion software giant has been trying to overcome for years. "I think that we have to listen to a broad cross-section of different people, including different user groups and analysts," Charles Wang, CA's chairman and chief executive officer, said in a recent interview.

Most of CA's new pricing plans are aimed at securing users who will use CA software for five years or more. Mike Egan, an analyst at Meta Group, Inc., said the new pricing policies are attractive for those users who expect to run a CA mainframe system and application software for a long time and for those who can pay for the maintenance and licensing costs up front.

However, Egan said he is advising his 100-plus mainframe system user clients to consider alternatives.

"Almost all of our clients are negotiating a better deal with Legent Corp./Goal Systems International, Inc., Boole & Babbage, Inc., Candle and even IBM than what they can negotiate with CA," Egan said.

Colin Crook, a large CA user and chairman of corporate technology at Citibank NA in New York, agreed. "I think everyone needs to study [pricing] in some detail," he said.

To qualify for the new pricing programs, users are required to register for CA's Total Client Care (TCC) program at no charge. But many of Egan's clients have been reluctant to sign up for TCC because the program permits CA to monitor where and how its software is being used throughout users' information systems shops, he said.

Other users were more upbeat about the price changes.

"It's great. The issues of upgrading licenses by size, consolidation and the licensing issues raised therein show that CA has taken good points of contention raised by its customers," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh.

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New app spurs backup plan

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Growing demand for processing — stemming largely from a new business service — has prompted Wall Street's largest clearinghouse for securities trades to build a backup data center and to place that center close at hand.

The Depository Trust Co. (DTC), with $5.5 trillion of securities on deposit, will introduce a new report this summer. The results of securities trades made each business day will be sent out to DTC's 548 participants, which are mostly major banks and brokerages.

Because DTC has to complete transaction processing for the new report and for other operations by the close of each business day, the company decided to construct an alternate data center near its main data center so processing can be reestablished within three hours, according to Christopher Lord, DTC's systems software director. The new center is scheduled to be operating by July 1.

DTC has relied on Sungard Data Systems, Inc. for disaster recovery at Sungard's facilities in Philadelphia. However, Lord noted, it takes 24 hours for DTC to resume processing at the Sungard center after a disaster — far longer than DTC can stand by with its plan for the new commercial report.

The disaster recovery center in Manhattan will enable DTC to handle short-term commercial transactions in which same-day settlement is vital.

Mirror image

The new backup data center will mirror DTC's primary center in terms of equipment, housing an IBM Enterprise System/9000 Model 830 mainframe, three Storage Technology Corp. ACS 4400 automated tape library subsystems, 800G bytes of IBM direct-access storage devices and a FileTek, Inc. optical disc-based Storage Machine.

DTC officials would not disclose the cost of the new facility.

Lord said the FileTek machine, which was installed at DTC's main data center in 1988, serves 1,300 staff members and has already saved the company $1.4 million in microfiche storage costs. The write-once read-many-based optical disc system houses 12-in. platters. DTC's IBM mainframes run IBM's MVS/ESA SP Version 4.2, DB2 and CICS systems software.

Concurrent storage

As information is transmitted from banks and brokerage houses each day to DTC, updated records will be written to disk files at both facilities.

The facilities will be linked to each other via fiber-optic cable, using IBM's Escon architecture as well as a bus-and-tag connection.

DTC's primary IBM mainframe and the backup FileTek machine will be linked through channel connections as if the FileTek unit were locally attached.

Lord said the fiber-optic connections will provide DTC with more communications flexibility, since bus-and-tag connections are limited to distances not exceeding 400 ft.

Data centers cut expenses by recycling numerous items

CONTINUED FROM PAGE 65

the tape's life. Other items that companies can consider recycling, according to Blanton, include printer ribbons, compact discs, plastic printer toner bottles and personal computers. The plastic from the latter three are used to make a new material called Polywood.

"You can cut it, nail it, glue it — do everything except burn it," Blanton said. Some Polywood manufacturers will even pick up used PCs and other items from out of state.

Getting firms to pitch in

The largest challenge in getting started can be finding manufacturers willing to cooperate.

"We asked about toner cartridges, but apparently we didn't ask the right people," said Emily Johnson, corporate data center manager at Stop & Shop Cos. in Braintree, Mass. "We're interested in recycling anything we can."

The company already recycles 76% of the paper produced by the data center, and it plans to address an even higher percentage within a few months when it begins recycling all paper, not just white bond.

Johnson said trash pickup costs have decreased by 42% since the program began in October 1990.

Blanton suggested that anyone interested in recycling data center items contact the local branch of the Environmental Protection Agency, which maintains lists of vendors that work with user organizations to recycle.

He also suggested that users line up at least two vendors for every recyclable item. "I see vendors come and go, so keeping a backup is a good idea," Blanton said.

Another crucial component is employee education so everyone knows just what to recycle and how to do it. End users can even become involved with trade-in programs for printer ribbons and cartridges.

NEW PRODUCTS

Utilities

Princeton Softech, Inc. has announced a new release of Version Merger for mainframes.

Release 3 offers a direct interface to Legent Corp.'s Endevor change management system, as well as moved record support, logic review areas and the ability to ignore changes among versions that are limited to comment records.

Pricing for Release 3 of Version Merger starts at $18,700 for a site license.

Princeton Softech
100 Route 518
Business Park Drive
CN 812
Princeton, N.J. 08542
(609) 497-0205

Raxco, Inc. has announced version 3.0 of Tapecontrol, an automated tape management system for VAX/VMS systems.

Tapecontrol prevents accidental overwrite of data and secures confidential off-line information from unauthorized access. Version 3.0 features a common network database for centralized support of remote tape operations and automated scheduling of nightly backup procedures. Enhanced off-site vault management, tape cleaning, tape replacement scheduling and a command line interface are also included.

Tapecontrol is available for VAX systems running VMS 5.X with licensing fees ranging from $1,950 to $11,500, depending on the VAX configuration.

Raxco
Suite 200
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Avtech Software, Inc. has upgraded Sniper, an idle process management software package for VMS systems.

Sniper 1.2 manages idle processes and tracks available disk space. Performance is enhanced in the new release, which also includes new utilities for viewing and altering Sniper's configuration file.

Pricing ranges from $495 to $2,195, depending on the central processor and system configuration.

The company also announced a competitive upgrade program that allows users of another idle process management package to purchase Sniper 1.2 for $250.

Avtech Software
Suite 500
19800 MacArthur Blvd.
Irvine, Calif. 92715
(714) 957-1978

Advanced Systems Concepts, Inc. has released DeviceShare Version 2.0 for Digital Equipment Corp. VAX systems.

DeviceShare allows users to access storage resources that are not directly connected to their local node. The product lets VAX systems share resources without the system overhead of a VAXcluster, the company said.

Pricing starts at $2,495 for a MicroVAX or small VAX configuration and runs to $5,000 for some VAX 9000 models.

Advanced Systems Concepts
33-41 Newark St.
Hoboken, N.J. 07030
(201) 798-6400

Applications packages

Software Engineering of America, Inc. has announced the availability of Keys Release 3.2.

Keys is a help desk automation package for MVS systems. It provides an on-line system for collecting, organizing and storing information on data center modifications. Enhanced archiving capabilities, database recovery features and new interfaces to popular job scheduling packages have been added to the new release.

Pricing on MVS systems ranges from $12,500 to $35,000. Keys is also offered for VSE systems.

Software Engineering
of America
2001 Marcus Ave.
Lake Success, N.Y. 11042
(516) 328-7000

System software

Parsytec, Inc. has created Parix, a new software environment for high-performance parallel processing.

Parix runs on any Parsytec system of 16 or more nodes that is linked to a Sun Microsystems, Inc. front-end system. It is fully scalable, according to the company, and allows users to develop applications with standard Unix tools. Parix provides program development tools as well as tools for machine administration and control.

Pricing for a 64-node MultiCluster I system running Parix starts at less than $100,000.

Parsytec
Building 9, Unit 60/61
245 W. Roosevelt Road
West Chicago, Ill. 60185
(708) 293-9500

Database management systems

Goal Systems International, Inc. has released Version 3 Release 1 of DB-Delivery for IBM's DB2.

DB-Delivery provides a set of database management tools for migration, catalog management, table editing, security and other functions. The new version provides enhanced change management services, a DB2 console log, full support for DB2 Release 2.3, enhanced shadow catalog support and other improvements.

Pricing ranges from $25,000 to $56,500.

Goal Systems
7965 N. High St.
Columbus, Ohio 43235
(614) 888-1775

I/O devices

Coax Direct, a division of Sherwood Digital Electronics Corp., has announced three new coaxial interface products for IBM printers. The products connect IBM 4019, 4029 and 4226 printers to a variety of processor types including 3090, 9370 and 3270 controllers. Features include automatic page-orientation printing and computer output reduction.

Retail pricing for the CD 4019, CD 4029 and CD 4226 cards is set at $995.

Coax Direct
2252 South 3600 West
Salt Lake City, Utah 84119
(801) 974-0526

Data storage

Emulex Corp. has announced the Palomar line of rewritable optical storage systems.

Palomar systems provide from 15G to 85G bytes of near-line storage capacity in removable 600M-byte cartridges. The products include an optical jukebox, jukebox management software and a host adapter for connection to the appropriate interface, including Small Computer Systems Interface, Digital Equipment Corp. VAX/HSC, Q-bus and Unibus systems.

According to the company, Palomar systems can exchange disks with DEC's WZ104 rewritable drive. Emulex's LaserManager software, included with the storage systems, provides operator utilities, catalog functions and a database of file and volume information.

Pricing ranges from $57,385 to $205,800.

Emulex
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Costa Mesa, Calif. 92626
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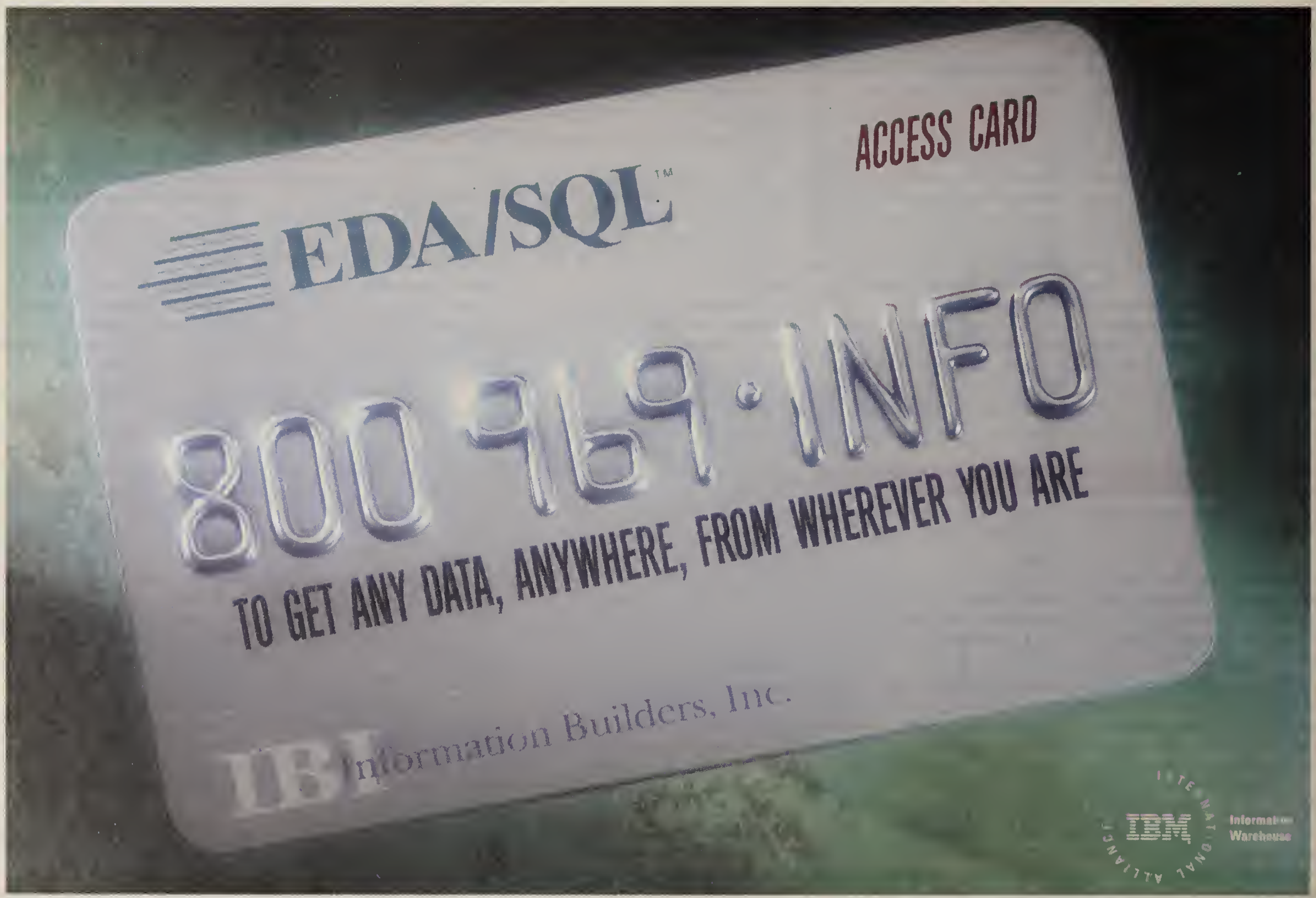

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IN BRIEF

Netron links to Bachman

■ **Netron, Inc.**, based in Toronto, announced a bridge to link its code generator to analysis and design tools from **Bachman Information Systems, Inc.**

Netron's CAPlink to Bachman Version 1.0 uses data flow information designed with Bachman/Analyst and Bachman/Database Administrator modules to produce reports, 3270-style screens and graphical interfaces for OS/2- or Microsoft Corp. Windows-based applications.

The product is priced at $1,000.

■ IBM Application System/400 applications maker **Software 2000, Inc.** said users will be able to modify human resources, financial and other packaged programs with application development products from **Synon Corp.**, which makes tools for IBM's minicomputer line.

The first phase of the plan will let users build extensions to existing Software 2000 applications via Synon Data Model.

The two firms also plan to modify Software 2000's Application Manager 2000 so that it can directly access Synon's Application Development tool set.

■ **Clarion Software Corp.**, which makes personal computer-based development utilities such as Clarion 4GL, merged with **Jensen & Partners International** (JPI).

A 5-year-old compiler maker in London, JPI is headed by Niels Jensen, one of the co-founders of Borland International, Inc.

The new company, **Clarion TopSpeed Ltd.**, is a wholly owned subsidiary of Clarion and will integrate JPI's TopSpeed family of compilers for Pascal, Modula-2, C, C++ and Clarion 4GL with Clarion's Professional Developer 3.0 tool set.

Xbase plan called a victory for users

BY GARRY RAY
CW STAFF

A proposal submitted to the American National Standards Institute (ANSI) last month represents a victory for Xbase users and application developers, according to its proponents in both the consulting and user communities.

Users also said they are reaping immediate benefits from the proposal, even though an Xbase language standard will be at least a year in the making.

"A standard will benefit everybody," said Joseph Groh, a senior developer at Union Central Life Insurance Co. in Cincinnati.

David Streit, local-area network manager at Deloitte & Touche in New York and a board member of the 700-member Microcomputer Manager's Association (MMA), said it "matters a lot to people who come from multiplatform environments."

Driving the proposal are concerns that multiple Xbase implementations are causing chaos in the user, developer and information systems communities.

Mark Schnapp, a Flushing, N.Y.-based developer and chief author of the proposal to create an ANSI Xbase language committee, said that a formal Xbase language will be "a stabilizing influence on the corporate and user side" of database application development.

Xbase users and developers want a standard to:

- Eliminate corporate concerns about Xbase applications.
- Ensure portability of applications within the organization.
- Reduce alterations to Xbase driven by competitive pressures.

Industrial supporters of Xbase standard and their products:

Borland International - dBase IV
*Computer Associates International/Nantucket, Clipper
Dvorak Development - Force
Emerald Bay Group - Vulcan
*Microsoft/Fox Software - FoxPro
Recital - Recital
WordTech - Arago, Quicksilver, dBXL

*CA and Microsoft are due to acquire Nantucket and Fox Software, respectively, by late June.

Users of Xbase language products such as Borland International, Inc.'s dBase and Fox Software, Inc.'s FoxPro now contend with divergent implementations of the language.

The proposal, submitted to the ANSI X3 chairman late last month, calls for an Xbase language committee with the authority to weld together the many variants of the language. Similar ANSI committees, comprising users, vendors and academics, already have wide-ranging authority over languages such as Cobol, Fortran and C.

Standard schedule

According to Schnapp, members of the ANSI X3 committee will vote on the proposal to authorize an Xbase standards group by mid-July. Its initial meeting could be held as early as mid-September, and its first draft of an Xbase standard could arrive as early as the fourth quarter of 1993, he said.

Despite the year-long timetable, corporate developers have found that the proposal is producing early results. "It's eliminated question marks around the viability" of Xbase database development, Groh said.

Continued on page 71

Oracle release surprises users

BY JEAN S. BOZMAN
CW STAFF

Oracle Corp.'s decision to ship a "developer's release" of Oracle Version 7.0 to users and software developers this month caught many users by surprise. Most had reportedly expected to wait for a formal announcement of the product on June 15, with eventual delivery of the production version in the fall. Now, the prospect of having all of Version 7.0's distributed database features available for experimentation and prototyping right away has users excited, according to recent interviews.

"They're giving people a chance to taste the code," said Michael Abbey, president of the worldwide Affinity user group, which holds quarterly meetings with top Oracle executives. "I think a lot of people are going to order it, if only to keep up with their peers."

Abbey, a database administrator at the Auditor General of Canada's office in Ottawa, said it will take four to six weeks for him to prototype some Unix applications running on a Hewlett-Packard Co. HP 9000.

"Most people want to get their hands on Version 7.0," agreed Warren Capps, president of the Mid-Atlantic Oracle Users Group in Alexandria, Va. "They seem to be willing to work with the inconsistencies, if there are any, because Oracle's being very clear to say this is for people who intend to put applications into production six months from now."

A letter in the developer's kit warns users not to treat it as production code, Oracle said.

Procedure triggers

One of the first things users will want to try, Abbey said, is to write the Version 7.0 "triggers" that will allow database applications to start up specific procedures stored in the relational database. Many users have held off trying to write application code, fearing they would guess incorrectly at the exact methodology, he said. Now, they know that Oracle recommends using SQL-Forms 3.0 to write Version 7.0 application code.

A full set of Version 7.0 documentation is included with the developer's release. "This is the first time the user community has had the opportunity to see the documentation," Abbey said. "A lot of people are going to use it as a report card, to see whether Oracle delivered on its promises."

Among Version 7.0's new features are two-phase commit, security "roles" for workgroups, referential integrity, triggers and stored procedures.

Members of the International Oracle Users Group (IOUG), some of whom have seen beta-test copies, agreed with Oracle developers that no more "Class One" bugs remain that would crash a developer's copy of the Version 7.0 system. An expanded beta-test program will track bugs while Oracle's users and developers begin to work with Version 7.0.

Dale Lowery, president of Oracle User Resource, said users were told production copies will ship this fall.

IOUG President Michael Corey said Oracle wants to prevent a repeat of the flawed rollout of Version 6.0, which had bugs in its initial 1989 release. However, extensive testing convinced Oracle that it was safe to release Version 7.0 code to the public, said Corey, who is vice president at Database Technology, Inc. in Boston.

No holding back

Oracle Version 7.0 will be offered, free of charge, to licensed users of Oracle Version 6.0 who have paid a maintenance support fee [CW, May 18]. Oracle software tools and all three of Version 7.0's new options for procedural programming, distributed features and parallel server modules will be included in the developer's release tape. After Oracle Version 7.0 enters production, users will be charged for these options.

Top executives at the $1 billion firm approved the early release of a developer's copy of Version 7.0 after it underwent extensive alpha-testing in-house — and yielded good results at 14 beta-test sites worldwide since August 1991, according to Oracle officials. Oracle has used the Version 7.0 relational database at its Redwood City, Calif., data center and to create an internal bug database.

Development of applications can span 12 to 18 months. That is why independent software vendors and value-added resellers said they want code now for 1993 applications. "We've seen a pattern of very tight bug-free code and very satisfied customers," said Tim Negris, Oracle's senior director for corporate strategy. "That gave us the confidence to make it available to a wide number of developers."

JEAN S. BOZMAN

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PC-based Cobol gets boost

Micro Focus promises easier desktop development of mainframe apps

BY GARRY RAY
CW STAFF

PALO ALTO, Calif. — Cobol supplier Micro Focus, Inc. plans to make it easier for Cobol programmers to design and develop mainframe applications using workstations equipped with DOS, OS/2 and Microsoft Corp.'s Windows.

Last week, the developer announced a slew of new products at its Santa Clara, Calif., user conference, including two database extensions to its Cobol Workbench and two programming environments that emulate the facilities and functions of IBM's IMS and MVS environments.

"They've made the migration off the mainframe very easy for people who don't want to go through the learning curve" required to use personal computer development tools, said Tony Picardi, director of software research at International Data Corp. in Framingham, Mass.

Bruce Nebel, a business systems development adviser at American Express Co. and a beta-test user for database extension products, said the software will dramatically reduce the costs of DB2 development and testing. When using traditional on-line systems, he said, "CPU utilization charges go through the roof instantaneously." American Express' planned transition to workstation development will "pay itself off in six months.

On the database front, Micro Focus will offer XDB Option — which includes a subset of Laurel, Md.-based XDB Systems, Inc.'s DB2 Workbench — and the Host Compatibility Option for IBM Database Manager, which will provide DB2 functionality to the OS/2 Database Manager. Both products work in conjunction with the company's Cobol Workbench.

Plenty to parade

Micro Focus officials also announced two emulation environments that will allow development and testing of mainframe applications on workstations. The IMS Production Option will add execution and testing facilities to the existing IMS Development Option, while the AD/MVS emulates the MVS TSO/ISPF programming environment used by many Cobol developers on PCs.

Micro Focus announced the following products:

- **IMS Production Option Version 2.5.** The extensions allow for testing and execution of IMS Cobol applications on PCs.
- **AD/MVS.** The product supports browsing, editing and ISPF/PDF screens and executes MVS JCL, PROCs and utility programs.
- **Host Compatibility Option for IBM Database Manager.** The product provides DB2 development tools and EBCDIC data conversion utilities for IBM's OS/2 Database Manager.
- **XDB Option.** The $1,250, PC-based DB2 development environment uses a subset of XDB System's XDB-Workbench and includes XDB's SQL database engine and Cobol precompiler.

KnowledgeWare and IntelliCorp finish link

BY KIM S. NASH
CW STAFF

ATLANTA — Computer-aided software engineering (CASE) company KnowledgeWare, Inc. and former takeover target and artificial intelligence firm IntelliCorp, Inc. announced a bridge to link KnowledgeWare's software design and construction tools with IntelliCorp's Unix-based back-end development products.

When merger talks disintegrated in October, the companies pledged to jointly develop CASE products for their overlapping customer base. Neither firm would reveal how big that joint base is, however.

"This product fulfills that promise," said Pete Privateer, KnowledgeWare's staff vice president for strategic product planning. He added that the company has no current plans for future codevelopment with IntelliCorp.

CaseConnection/ADW is a bridge designed to let users of KnowledgeWare's Application Development Workbench (ADW) build applications on Unix machines using IntelliCorp's ProKappa, an object-oriented application generator.

The product, which is available immediately starting at $40,000, includes software and services to translate entity relationship models in Encyclopedia/ADW, KnowledgeWare's repository, into ProKappa objects and relations. The price increases with the number of models that must be translated.

CaseConnection/ADW allows software engineers who use ADW for design and analysis of mainframe and IBM OS/2-based applications to have a companion CASE solution for Unix development, according to IntelliCorp.

Xbase plan called a user victory

CONTINUED FROM PAGE 69

Previously, he explained, IS managers had been concerned about issues such as application maintainence and programmer training costs, neither of which had been predictable with the different implementations of the Xbase language.

John Hoffman, broadcast operations software and systems designer at NBC in New York, said that "there has been resistance simply because [Xbase] is not a standard."

For Groh, the proposal produced immediate results. "In the past, we spent three to four weeks just to overcome" IS objections about using FoxPro to create a corporate application. By citing the nascent Xbase standard, IS managers tentatively accepted Groh's proposal to use the Xbase compiler "in 15 minutes," he said.

> "THERE'S TREMENDOUS leverage in having people know the same language."
>
> ADAM GREEN
> "THE GREEN LETTER"

A variety of Xbase developer organizations and vendors have supported Schnapp's proposal, he said. New York's Professional Association of Database Developers and the Association of Database Developers in San Francisco recently endorsed the move. Streit predicted that "if all goes well, the [MMA] board will appoint someone to the ANSI committee."

Longtime members of the Xbase community remained divided about a formal ANSI standard. On the plus side, "it's an inevitable step in the maturing of Xbase," said Adam Green, an Xbase authority in Boston and publisher of "The Green Letter," a newsletter for developers. "There's tremendous leverage in having people know the same language."

Yet Bob Byers, a partner at the Montrose, Calif.-based Emerald Bay Group and a longtime consultant to the former Ashton-Tate Corp., warned that "standardization can impede progress." Byers said he was concerned that Microsoft Corp. and Borland will unduly influence the committee, and he hoped that "we can stand on each others' shoulders rather than each others' toes."

NEW PRODUCTS

Development tools

SmartStar Corp. has announced Version 6.1 of the SmartBuilder rapid application development software for Digital Equipment Corp. VAX/VMS systems.

SmartBuilder interfaces with third-party computer-aided software engineering tools, allowing users to develop a complete data model of a new application. It then transforms the model into a working prototype that can be extended into a complete working application and distributed to end users.

All application elements are stored in a central SmartBuilder repository for maintenance and reuse.

Pricing ranges from $3,200 to $56,000.

SmartStar
120 Cremona Drive
Goleta, Calif. 93116
(805) 685-8000

Borland International, Inc. has chosen ProtoView Development Corp. to develop an interface design and code generation tool for the C++ ObjectWindows library. Version 2.1 is based on the company's existing ProtoGen computer-aided software engineering tool and was designed for easier application development within the leading C++ development environment.

ProtoGen 2.1 also features code generation for ANSI C, projects file generation for Borland's custom-control DLL and generates code to access these controls.

According to the company, users can create menus of any size and complexity, and menu templates can be saved and used again in other applications.

ProtoGen 2.1 costs $49.95.

ProtoView Development
353 Georges Road
Dayton, N.J. 08810
(908) 329-8588

Procase Corp. has added support for Hewlett-Packard Co. HP Apollo 9000 Series 700 workstations to the Procase Smartsystem software development environment.

The product lets users re-engineer C language code for porting to new platforms and maintaining and enhancing applications. It consists of five modules built around an object-oriented database. Smartsystem also provides multiuser capabilities including version control and function-level locking.

Pricing starts at $2,000 per module.

Procase
Suite 100
3130 De La Cruz Blvd.
Santa Clara, Calif. 95054
(408) 727-0714

Altsys Corp. has announced Altsys Facade, a tool kit for Aldus FreeHand Versions 3.0 or 3.1.

The product furnishes developers with a set of software routines that provide manipulation to Aldus FreeHand documents. Users can interact directly with Aldus FreeHand documents to write stand-alone applications for solving complex graphic design as well as publishing and printing needs.

The product has the ability to write applications to spell-check an Aldus FreeHand document, manipulate objects, substitute fonts, swap colors or report on placed graphics.

Facade is available on both Apple Computer, Inc. Macintosh and personal computer platforms.

Altsys Facade costs $300.

Altsys
269 W. Renner Road
Richardson, Texas 75080
(214) 680-2060

Computer-aided software engineering

System Software Associates, Inc. has announced enhancements to its AS/SET line of computer-aided software engineering products for the IBM Application System/400 platform.

AS/SET Version 2.1 has more than 30 new features, the company reported, including new code regeneration and interactive prototyping facilities, an expanded repository of design definitions and SQL or native data-access verb generation.

The AS/SET IWS option runs on an intelligent workstation attached to the AS/400.

Pricing for the development kernel runs from $35,000 to $100,000; the workstation option costs $5,000 per workstation license.

System Software Associates
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As for maintenance, a Gartner Group study showed that, even back in 1990, more than 80% of IEF developers were getting gains of from 2-to-1 to 10-to-1.

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The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC and CICS) since early 1988. Now you can develop systems in OS/2 and automatically generate for DEC/VMS and some UNIX platforms. TANDEM, Microsoft® WINDOWS, and more UNIX will be available soon.

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The kit is priced at $10,000 (limit one per customer company). That's about one-half the regular cost of the toolsets.

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Government purchasers, please reference GSA #GS00K92AGS5530

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VP, Information Technology
AETNA

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Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce Aerospace

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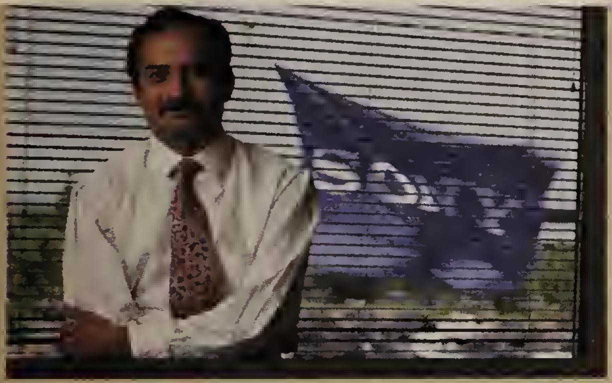
Tom Jeffery
Sr. VP, Information Systems
Target



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Venkat (Vinnie) Tiruviluamala
Director, CPC/CPPC Information Systems
SONY Corporation

"We used an IEF frequent flyer template to build our 'Canadian Plus' system. A major redesign, estimated at 4-6 months using previous methods, took less than a month. Now we're providing better customer service, and maintenance costs are greatly reduced."

Bill Palm
President, Canadian Technology Services
Canadian Airlines

"Our new Customer Order Services Marketing Information System—over 500 transactions and 250 entities—is in production. Quality is excellent and our users are very pleased. Dedicated people armed with the IEF advantage have made COSMIS a success."

James R. Engle
Director, Systems and Programming
Rhône-Poulenc Rorer

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Roger Strand
Application Development Consultant
First Federal Lincoln

"The IEF tutorial is very well done. I feel comfortable with this software and I have acquired the skills to build simple systems. The tutorial is a very fast and effective means of evaluating the capabilities of the IEF."

Margaret Kubaitis
Research Programmer, IS&S
University of Illinois

"The IEF tutorial is put together very well and quickly illustrates how to construct a system using the IEF. It gives one the basics to start getting the job done. I feel I am prepared now to build simple systems using the IEF."

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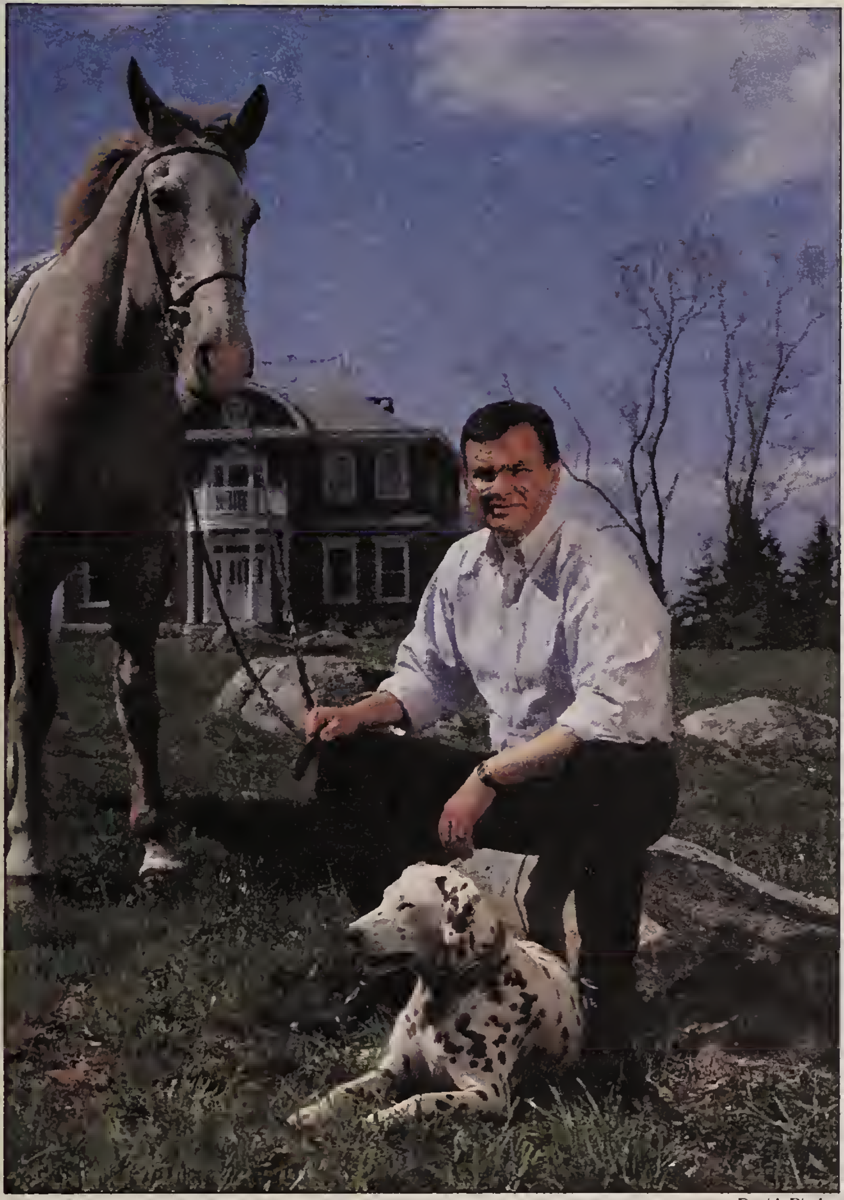
EXECUTIVE REPORT

ALIGNING IS

Sync or swim

IS groups that don't hop on board with company business plans may find themselves adrift and far from shore



David Binder

Fleet/Norstar's Zucchini: *Skill at fusing technology and business goals helped make him one of the best-paid CIOs in the country*

BY CANDEE WILDE

Michael Zucchini is puzzled. A 25-year computing veteran, he can't fathom the ongoing debate over whether business or technical smarts is more important for keeping information systems in step with corporate goals. "You need both," says Zucchini, chief information officer at Fleet/Norstar Financial Group, Inc.

His skill at consolidating bank computer operations, among other areas, has helped drive Providence, R.I.-based Fleet/Norstar's aggressive acquisition strategy. Zucchini's latest project: helping absorb the recently acquired Bank of New England and halving its $180 million IS budget over the next 18 months.

Sadly, Zucchini is a rarity in business today: an IS ambassador who makes synchronization between IS and business look simple.

Despite years of being constantly badgered to "learn the business" and become more mainstream, some IS shops remain marginalized and semirelevant. For many, that could spell big trouble, especially during a recession. Top corporate honchos continue to demand that IS deliver or face severe cutbacks and possibly outsourcing. Indeed, IS gossip is not unacquainted with whispered tales of technology chiefs whose organizations strayed further and further from the corporate path before finally crashing by the wayside.

Studies confirm that turnover of top IS personnel is rising. IS chiefs who can't deliver, says Douglas Brockway, a principal at Nolan, Norton & Co. in Boston, are being "invited to do their work somewhere else."

Conversely, those in IS who succeed in bridging the gap can be handsomely rewarded: For example, Zucchini's annual salary last year topped $650,000, making him one of the best-paid CIOs in the country. He also earned the title of executive vice president.

Same old, same old

The challenge of synchronizing technology and business dates back to the 1970s, consultants say, when businesses began pouring more money into technology. "It's always been critical, and it's always been a problem, and it always will be a problem," says John Kinnear, director at The Index Foundation. The London-based unit of CSC Index, Inc. recently opened U.S. operations in Cambridge, Mass., and has published a research report entitled "Strategic Alignment."

But pressure tends to mount, consultants say, when new technology catches on — first minicomputers, then personal computers and local-area networks — and during tougher economic times.

So the average senior manager today surveys millions and perhaps billions in IS investments in a time of tightly corseted budgets, Brockway says, and "still doesn't see where the bottom line of the competitiveness of the company has been fundamentally changed."

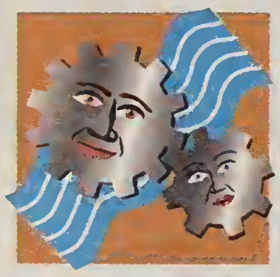
According to "The '92 CEO/CIO Survey" by Booz Allen & Hamilton, Inc. in New York, few IS departments are having the desired impact on competitiveness, customer service and profitability. The result: Top management goes gunning for a money-swilling IS group that doesn't appear to be pulling with the rest of the corporate team.

Given the potentially gruesome results for both IS and the business, it's small wonder that three recent surveys of chief executive officers and CIOs found that aligning technology and corporate goals is the most critical concern facing IS groups.

A survey by CSC Index found that "aligning IS and corporate goals" was the top issue for 566 IS executives polled in North America and Europe.

In a survey of nearly 350 organizations,

Continued on page 77



Sync or Swim

KEY POINTS

Several national surveys show that synchronizing technology and business remains a top priority for CEOs and CIOS.

Despite the importance to their companies and careers, many IS groups still do a poor job of aligning with business goals.

Internal politics, fuzzy management vision, executive apathy and time pressures all hamper efforts to synchronize.

IS managers use a wide range of tactics to better align, depending on style.

Many consulting firms are offering services aimed at better coordinating technology and corporate goals.

User stories: Fleet/Norstar, Echlin, Merchants Distributors, Trans Ocean, Home Oil, Bowater Communication, city of Dallas and Atlantic Mutual. Pages 77, 78 and 79.

QUOTABLE:

"Management doesn't go around and pat everyone on the back and say, 'Gee, please line up with our business plan.' "

Richard Hock
Echlin Corp.

Wilde is a free-lance writer based in Easton, Conn.

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   - 60. Government - State/Federal/Local
   - 65. Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Programming Management, Software Developers
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
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3. **IS INVOLVEMENT** (Circle all that apply)

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   - B. Recommend/Specify IS Equipment
   - C. Purchase IS Equipment
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If IS groups don't hop on board, they may find themselves adrift

CONTINUED FROM PAGE 75

SYNCHRONIZED SWIMMING

Getting business and technology to stroke together is a top concern, but much work remains

Survey of 360 CEOs and CIOs of Fortune 1,000 companies. Multiple responses allowed.

Where they are now	
■ Business vision serves as basis for systems vision.	64%
■ Senior management doesn't explicitly state/document business vision.	13%
■ Systems vision completely integrated with business vision.	12%
■ Other.	11%

Major obstacles	
■ Organizational complexities/barriers.	53%
■ Business vision not clearly articulated.	41%
■ Lack senior management interest in IS vision and strategy.	40%
■ Lack of time and resources.	21%
■ Cannot agree on strategy to help realize vision.	12%
■ Have not been asked to articulate IS vision and strategy.	12%
■ Lack of expertise to define IS vision and strategy.	11%
■ Cannot agree on systems vision.	8%

Source: Booz Allen & Hamilton, Inc.

CW Chart: Tom Monahan

Howard Rubin Associates, Inc. in Lexington, Mass., found four themes: producing business value through technology, maximizing the yield of IS activities, harvesting the benefits of improved IS effectiveness and managing the bottom line.

Easier said than done

While making sure that IS and business are pointing in the same direction sounds like the simplest, most logical thing in the world, IS managers and consultants agree it's far easier said than done (see chart).

In fact, The Index Foundation's Kinnear says, in most organizations, true alignment is probably unattainable. "People are never going to achieve perfection. Business is changing too fast." Moreover, a huge number of legacy systems and differing approaches required by re-engineering (as opposed to simply automating) further complicate matters.

Despite such obstacles, Kinnear and others agree that striving to better link technology and business remains a worthy, necessary goal.

Different IS chiefs have adopted tactics based on their own styles and organizations. At Fleet, for instance, Zucchini sees his goal not so much to align IS with corporate strategy as to actually help develop and drive that strategy — the pinnacle of IS achievement.

By recognizing a business issue, — in this case, overcapacity in the banking industry that would force cutbacks and extensive consolidation — Zucchini was able to apply his technical knowledge and come up with a solution that reduced expenses and improved profitability.

Since 1988, Fleet has consolidated 12 data centers into one and 20 back offices into four. "I don't call it downsizing. This is intelligent re-engineering of the process," Zucchini says.

Zucchini says there's nothing magic about his approach: He relies on the usual mix of formal meetings with department heads, informal lunches and dinners. Put simply, he says, IS executives "need exposure [within the company]. People have to teach you the business."

Calvin Sihilling, vice president of IS at Merchants Distributors, Inc. in Hickory, N.C., also takes a personal, off-court approach to making sure he's in sync. He likes to work out at a local health club with co-workers to keep a finger on the corporate pulse. "You don't talk about new technologies; you talk about what the business is doing, what the competition is doing." he explains. "You ask, 'If you could get something that would really help you do your job, what would it be?' " The answer probably won't be the latest technology, he says.

Sihilling is keen on positioning his group as just another team player. "IS has tended to differentiate itself from other parts of the organization, and we shouldn't do that. We're just another part trying to get the job done."

Echlin: IS must keep watch

While technologists can only be as solid as the boat they're riding in, many IS directors stress that it's ultimately the responsibility of IS to make sure money and time are well-targeted. "Management doesn't go around and pat everyone on the back and say, 'Gee, please line up with our business plan,' " says Richard Hock, director of MIS at Echlin Corp. in Branford, Conn.

At Echlin, each functional department prepares an annual business plan in support of the broad corporate strategy. Hock asks members of the IS department to list key issues for the coming three years. They must also list major IS expenditures planned for the next year and present an inventory of installed hardware.

With this information, Hock can evaluate whether the division is moving in the right direction — that is, in step with the company. "We're entrepreneurial in the sense that we are expected to support the company in some way. If you don't show what you're worth, they eliminate you," he says.

Though most approaches are commonsense and fairly easy to do, business and technology still have not gotten in sync at many companies. At The Index Foundation gathering this month in Boston, for example, more than half of the 150 top IS executives ranked themselves in only the earliest stages of synchronization, according to Kinnear.

Booz Allen blames current methods of managing IS, which ironically are seen as preventing the businesses from carrying out their main purpose: making money.

"It is a model that essentially operates as a utility: large-scale but not flexible, not creative," explains Steve Perkins, a vice president at the New York-based consultancy.

"CIOs need to be seen as a catalyst for business results. They need to talk and act that way," Perkins explains. "I don't think they do that now."

But the problem does not lie just with CIOs. Technical people, Perkins says, must be allowed to try — and fail — in the same way business people do.

Consultants smell business

The clamor to better link business and technology has led to a scramble by consulting firms eager to advance their own solutions. CSC Index, for example, sees a four-step approach, culminating in re-engineered business processes, as the best and most effective approach. McKinsey & Co. promotes "core process redesign."

Booz Allen has developed a method of switching IS from what it describes as a "service station" function to a "power station."

Essentially, this new model involves two components. First is a management function that provides low-cost, high-volume information services to the company. Second is a group of "self-starters go out and solve new problems with the business people" by using intelligent technology to increase market share, improve customer service or develop new products, Perkins explains.

Using outsiders can help unjam a company, says Peter Abene, director of corporate market analysis at Electronic Data Systems Corp. in Dallas. "Sometimes it takes a fresh viewpoint to get them on the right track," he says.

Whatever the approach, nothing short of a revolution in IS management style is needed, says Howard Rubin, CEO of Howard Rubin Associates.

Besides understanding the business, Rubin recommends that companies develop technical scorecards to manage the performance of the IS function and tie that scorecard into the whole business. Measurable items must suit the business, but some broad possibilities include the following: rankings against industry peers, ability to deliver commitments, investment in productivity tools such as computer-aided software engineering and proper selection projects.

The best CIOs, Rubin concludes, must "walk the border" between business and technology. The worst CIOs, it might be added, run the risk of stepping too far off the path and drowning in the abyss. •

Are you on board?

Here are signs that your IS organization is aligned with your firm, Howard Rubin Associates says:

- You know, understand and can articulate the business case for every piece of work you do.
- You focus on projects that improve internal business processes and the organization's ability to innovate.
- You measure as a business would.
- You take every opportunity to position yourself "above the line" in the corporate value chain.

New course bridges technology gap

Microsoft Corp. has unveiled a new three-day course aimed at bringing business managers into the technology planning process. "New Architectures for Enterprise Computing" is offered in Washington, D.C. (June 15-17) and in Seattle (July 13-15). Call (310) 394-8305.

CSC Index, Inc. has opened a U.S. office of The Index Foundation, an international research service. The service provides reports, conferences and meetings. Call (617) 492-1500.

ARTICLES

"Accelerating Front Line Change"
Richard Heygate
McKinsey Quarterly
No. 2, 1992
(212) 446-8033

"Core Process Redesign"
Robert B. Kaplan and Laura Murdock
McKinsey Quarterly
No. 2, 1991
(212) 446-8033

REPORTS

"The 1992 CEO/CIO Survey: A Prescription for IS Effectiveness in the '90s"
Booz Allen & Hamilton, Inc.
(212) 697-1900

"The Politics of Information, Understanding and Redesigning IS Processes"
Ernst & Young
(617) 742-2500

"Workgroup Technology: Tying Technology to Business Objectives"
IDC white paper
(508) 872-8200

BOOK

The Information Mosaic
Sharon M. McKinnon and
William J. Bruns Jr.
Harvard Business School Press
March 1992

Stayin' aligned: Five tales

Ways of staying in step with business goals differ as much as individual companies. Smart IS managers are always looking out for new tips and techniques. *Computerworld* free-lancer Barbara Francett asked six diverse organizations for their approaches. Their stories follow.

LAURIE RAUCH

BOWATER COMMUNICATION PAPERS, INC.

Information engineering and CASE help the Moline, Ill., firm involve business units in application development. An eight-member executive committee, including IS, sets business goals and strategies. Informal questioning may be supplemented by a Total Quality Management program.

When Bowater Communication Papers, Inc. (BCP) sprang from two corporations merged six years ago, information systems management knew that technology and corporate goals would have to get in step quickly, or the new firm would run the risk of crumpling up like a ball of paper.

The four groups involved after the 1986 merger with Star Forms, Inc. — two IS departments and two corporate staffs — were hardly similar. "Goals and strategies, business rules and applications were drastically different," recalls Laurie Rauch, vice president of IS at BCP. Today, the merged company, which makes and sells computer and printer paper, is a $300 million unit of Darien, Conn.-based Bowater, Inc.

The first step, Rauch says, was to merge the two firms' data centers in Moline, Ill. "Our systems focus had to change with the times," she explains.

During the conversion, IS discovered that the data was similar, but things soon got tricky.

Choosing targets

Aligning applications with the business goals of the newly united company became a top priority, Rauch says. The problem, she adds, was identifying goals.

"Going through a steering committee would not have been effective because of the bipartisan politics of the two companies involved," Rauch explains. She found herself rebuilding applications for two different companies with mirror-image databases. "It was not," she recalls, "a productive approach."

So Rauch began looking for a way to help IS more easily develop projects that could support both groups. In 1989, BCP began to apply a methodology marketed by Information Engineering Systems Corp. in Alexandria, Va. The vendor's IE:Expert computer-aided software engineering (CASE) tool was also employed.

In theory, information engineering translates mission statements, goals, critical success factors and strategies into data, which is then clustered into functional areas. In practice, the company's eight-member executive committee, including Rauch, sets business goals and identifies critical success factors and strategies to support them.

The business plan divides into functional areas such as product development, marketing, manufacturing, sales, finance and human resources. A team of business and application project leaders is selected. Members then develop tactical, operational and process models.

"Based on business priorities assigned to those strategies, we can then look at the data model to see which are supported by current systems and which need support," Rauch explains.

Information engineering lets IS facilitate business planning and document business plans, she says.

"We used to use the traditional approach of interviewing end users to develop system specifications," she says, "but it wasn't effective in our new environment." Today, staff brainstorm a single answer to each problem.

Drastic solution

A good example is BCP's new Unix-based, client/server approach to systems designed to promote better information sharing between groups. Before the data centers were consolidated, BCP ran two Hewlett-Packard Co. 3000s with HP's Turbo Image database. The firm has since switched to four distributed HP 9000s — one for every two BCP plants — under HP/UX running Sybase, Inc.'s Sybase software.

"Making such a drastic change from the way we used to work is risky and costly," Rauch says. "But the project team approach is worth it because it allows us to directly tie development costs to specific projects and see a business payback."

Implementing project teams is a long-term process that requires training workshops for everyone at all levels, Rauch cautions. And making sure IS stays aligned with the business often means asking tough questions of both groups: Is the overall vision right? Are we supporting the strategic objectives in a timely manner? Are people learning? Is quality improving?

Rauch would like to extend that informal assessment technique to a more formal, quantitative assessment method and is looking into Total Quality Management as one possibility. In the meantime, BCP uses decreasing error rates and increasing productivity as measures of the success of the project team approach.

"Our process is improving," she says. "We're being more responsive in supporting new strategies, such as branding a new product or changing products. But the ultimate test will be if we can be more cost-competitive in the marketplace. It's too soon to tell that yet."

BRIAN ANDERSON

TRANS OCEAN LTC

Local and regional IS staffers serve as user liaisons in remote field offices. Extensive prototyping helps ensure applications are useful. Communications with internal and outside customers are measured. IS sometimes does end-user jobs to gain insights, and the IS director reports directly to the CEO.

Trans Ocean LTC may call San Bruno, Calif., home. But as one of the world's largest shipping container leasing companies, it must ship information and products to business units and users around the globe.

The $150 million company asks IS to create uniform systems for end users in 20 offices in major world ports. Moreover, differences in culture, language, law and currency make harmonizing with business even tougher, says Brian Anderson, director of IS.

Andy Freeberg

Trans Ocean's Anderson: *'You can't let users drive the needs of the company, and you can't sit in the glass room, either'*

Trans Ocean has targeted automated decision-making as a way to achieve uniformity. Anderson says this approach depends on a solid IS understanding of business needs. "If we don't understand the decision criteria for a given worker in a given area, we can't provide the appropriate information," he explains. "If the decision criteria are wrong, the decisions will be wrong."

For instance, currency exchange rates affect whether containers in need of repair are fixed or sold. In the past, flaws in Trans Ocean's currency conversion system caused containers to be sold when it would have been more cost-effective to fix them, and vice versa.

"The system makes its decision based on the currency and exchange rates for a particular date," Anderson says. Unfortunately, IS had chosen one date as a base and the repair depots another. It turned out the depots were right, and the system was altered accordingly.

Other decisions are often based on input from several functional areas, such as sales and marketing, equipment control, management or repair and maintenance. "It's up to IS to meld diverse group requirements," he says. "We have to understand each functional area."

New face for IS

This recognition has led to new paradigms and structural changes for IS.

"You can't let users drive the needs of the company, and you can't sit in the glass room, either," Anderson says. "The top IS person needs to be involved in the decision-making process and understand where the company is going. You have to be in the boardroom and on the front lines."

The former is accomplished by reporting directly to the chief executive officer, the latter by closer contact with end users.

IS supports field sales and marketing offices. A local or regional staffer maintains the networks and acts as a user liaison. User needs are relayed to home office systems developers, where the development process has also changed.

"In the past, we sized things up, decided what people needed and gave it to them," Anderson says. "Now we do more prototyping and interact more with end users to show them what we're doing before it's codified. This improves our chances of creating a system that people want and need."

IS effectiveness is gauged by comparing each application developed to the original objectives. Projected vs. actual savings, correctly captured data and specific goals, such as improved communication with internal and external customers, are also measured.

Informally, Anderson tries to keep on track with business goals by keeping in touch with end users.

"We sit and work with them. We try to make their decisions based on the information they get. We make sure they're getting what they've paid for," he says.

This means a new role for IS. "Systems aren't an end to themselves," Anderson says.

ARTHUR HOLLERS

CITY OF DALLAS

Analysts in each customer department meet regularly with programmers to convey requirements. The IS director and city officials also get together regularly.

Think it's less important for public sector IS groups to stay tuned in? Arthur Hollers will set you straight.

Even though a municipality can't be swallowed up by a hungry takeover artist, a city IS department can be replaced by savvy end users or an outsourcer. So two-way dialogue is key.

"We can't dictate to our customers

because they won't accept it. We must integrate their needs with our plans," says Hollers, data operations manager in the IS department for the city of Dallas. "If we don't, they'll fulfill their needs elsewhere."

The customers of Dallas' 185-member IS staff are numerous and varied: fire, police, finance, water, streets and sanitation departments and the public library. As in commercial business, each has its own unique set of needs.

And Dallas never sleeps: City employees operate more than 2,000 terminals around the clock. For IS — including the communications, telephone and radio and programming and operations groups — this means providing nonstop availability from the city's Amdahl Corp. 350A and IBM 3084 and 4381 systems.

Close and constant communication, from the bottom up and the top down, with customer departments is key to meeting those needs, Hollers says.

"Analysts in each customer department meet regularly with our programmers to convey their requirements. Our director also meets with their directors to provide direction from the top," he says.

IS also sends out annual surveys to customer departments. Hollers says, "It's a way to check how we're doing and ask for suggestions for improvement."

Identifying customer needs, however accurately, is only half the task. These needs must then be fulfilled within the confines of a tight budgetary vise because of six years of budget shortfalls in Dallas. "We may need new technology to best service a customer, but the budget may force us to make do with old equipment until next year," Hollers says.

> "WE CAN'T DICTATE to our customers because they won't accept it. We must integrate their needs with our plans."
>
> ARTHUR HOLLERS
> CITY OF DALLAS

Show, don't tell, benefits

Dallas' IS group contends with this dilemma in two ways. One is to free up funds by demonstrating to the budget committee the cost benefits of a new technology, such as replacing a reel tape drive system with a cartridge-based one that eliminates two worker-years. The other is to emphasize technologies that help preserve life and property.

For instance, an imaging system for the police department and a map tracking system for the city's ambulances and fire trucks dramatically illustrate the value of meshing IS and customer goals.

"When accidents happen, the image system lets police retrieve records from the mainframe faster," Hollers explains. "By integrating 911 service with our computer center, a dispatcher can bring up information on screen by hitting a single key."

Those capabilities, combined with the mapping information provided to vehicles via radios and a microwave network, get rescue vehicles to the scene faster. The benefits are simple and undeniable, according to Hollers: "Speed equals lives."

For the project, the city won the 1990 Partners in Leadership Award from the Society for Information Management.

LES BROUGH

HOME OIL CO.

An executive committee approves IS plans for the Calgary, Alberta, oil and gas explorer. Workshops help educate end users, who assist in selection, about off-the-shelf packages. The company is also flattening out, including IS.

A tight bond between technology and business is never more crucial, perhaps, than when a company and industry are in dire straits. That's the case for Home Oil Co. in Calgary, Alberta. For Les Brough, manager of IS at the oil and gas exploration company, there is no choice but to focus IS on the company's most basic needs.

Years of oil and gas oversupply have prompted widespread cutbacks, downsizings and reorganizations among companies in the $6 billion industry. Home Oil also carries a large debt, a painful souvenir of its separation last year from Interprovincial Pipeline, its former parent. The split caused a major shift in short-term business goals.

"Cash flow is now earmarked for debt reduction rather than exploration," Brough says. "It will take us three years to put our debt/equity ratio back in balance. We've had to look at strategies carefully to survive."

Survival tactics

As a result, $240 million Home Oil has cut its staff, including IS, by 25%. Another 15% will be cut in the next three years, paring IS down to about 40 workers.

"A year ago, we went through a planning exercise to respond to what our business had become," Brough says. The IS plan was delivered to — and accepted by — the executive committee last September and passed IS and other staffers two months later.

The plan had five main tenets: stop in-house development, stop maintaining in-house systems, begin to migrate away from the mainframe, use off-the-shelf software and move to open systems.

Brough and his staff met with the client departments to define critical system support. "We explained that we could only do what absolutely had to be done," he says. "We had to start asking hard questions when people made requests."

Home Oil's two Digital Equipment VAXs, a Model 8530 and a Model 3300, have already been replaced with a Prime Computer, Inc. 9750 minicomputer. A Prime 9955 will disappear by the fall, and migration away from the Amdahl 5870 mainframe will take place during the next three to four years.

Replacing them are IBM RISC System/6000 Unix-based servers and workstations, as well as Sun Microsystems, Inc. workstations running specialized industry software. Brough says he expects that functionality might suffer.

"It's been a hard sell to those who've been used to getting 100% of what they want," he acknowledges. "We've had to explain that if we don't compromise, we won't exist as a business." The support of departmental managers has helped get the message across to workgroups and departments. "We've also published our story in the company newspaper, and we're running seminars for the systems staff explaining the changes in how IS will operate," Brough says.

End-user workshops are also being developed with an outside consultant. Users "will have to be involved in going out and finding the best packages," Brough says.

Nothing stays the same

The changes aren't over yet at Home Oil, either. What was once a hierarchical, vertically organized company is flattening out — eliminating an entire layer of middle management — to a horizontal arrangement of work teams throughout the company, including IS.

Throughout the evolution, communication will be emphasized. "We just participated in informal discussions with other division managers and company vice presidents to check our progress," Brough says. "We'll review our goals again later this summer to make sure we're on track and that people haven't gone off and done something else."

At the same time, Brough says he is looking beyond the next three bare-bones years in hopes of crafting IS and business strategies for better times. He's optimistic that successful exploration strategy and systems to support it lay ahead.

JERRY KUECK

THE CHARLES MACHINE WORKS, INC.

Relevance is guaranteed by letting users design most systems. The Perry, Okla., manufacturer selects "functional representatives" from each corporate department to meet regularly with IS.

The Charles Machine Works, Inc. keeps in line with business needs by letting users design most of the systems. The payoff: annual productivity gains exceeding $300,000, according to company officials.

Improved competitiveness is the goal, explains Jerry Kueck, technical support manager at the Perry, Okla., firm, better known for its Ditch Witch products.

The IS group has begun a program that makes members of each corporate department "functional representatives" who interact regularly with IS.

IS manager Alan Hawkins says these representatives, key clients and customers work to design data and processes that are useful in the part of the business they represent. It works like this: A functional representative first goes through a class in which IS employees teach the fundamentals of data modeling. Some reps are trained to help IS design relational database management systems using CA-Ideal fourth-generation language and CA-Datacom DBMSs from Computer Associates International, Inc.

The approach, however, hasn't always played well with senior managers, who initially felt they had better things to do, Hawkins says. "I had one senior manager tell me during class that it was the biggest waste of time he'd ever seen in his life," he says. "He is now one of the greatest proponents of what we're doing today."

Meetings between IS and representatives typically take place once a month, but during the time of year when the corporate and the IS department plans are being developed, meetings are much more frequent.

"Not many companies are doing this, and we can't understand why. It takes a company that is willing to do something radically different," Hawkins says. Support from the company president has been a huge plus in giving the company enough time for Charles to learn and refine the process, he notes.

HARRY WALDRON

ATLANTIC MUTUAL COS.

Videoconferencing, frequent phone calls and letters keep personnel in New Jersey and Virginia in sync. A 13-member steering committee meets quarterly to review technology projects. A planning guide keeps committee members and IS abreast of all projects.

At the Atlantic Mutual Cos., geography is no barrier to face-to-face communication.

Even though most of the insurer's key business units are located in Convent Station, N.J., the firm's IS group works closely with users to coordinate system priorities — even though the group is located in Roanoke, Va.

"We meet with users via videoconferencing, supported by frequent phone calls and letters," explains Harry Waldron, applications systems manager.

For example, business staffers in New Jersey recently needed to meet with Virginia-based people, including IS staffers, to discuss state reporting guidelines. "We have to change to the new plan by the beginning of next year," Waldron explains. "This is a good way to facilitate planning and keep IS on top of the business goals."

Information addict

Like other insurers, 150-year-old Atlantic relies heavily on information to keep its $750 million property and casualty business running smoothly. A 13-member steering committee — which consists of all the insurer's senior officers — evaluates technology projects quarterly. The status of current projects is reviewed, and new projects are recommended.

"We also regularly produce a planning guide to share projects in progess with the steering committee and IS staff members," Waldron adds.

To Waldron, learning the business means being able to talk shop with other executives. He says he is taking insurance courses and has completed nine out of 10 exams needed for certification in Charter Property Casualty Underwriting.

The result: added business value to applications development. "For example, recently we were rewriting a premium and claims accounting system. The insurance courses I've taken made me aware of data elements we have not captured in the past," Waldron says.

Applications development is divided into groups. Each supports a strategic business unit: commercial lines, personal lines, finance and automated claims processing. "Each group works closely with each business unit to align priorities and get maximum throughput," Waldron says.

In the future, IS is hoping that leading-edge technologies such as object orientation and CASE will help developers keep abreast of the business by responding more quickly. "The more our business relies on automation, the more responsive we'll have to be."

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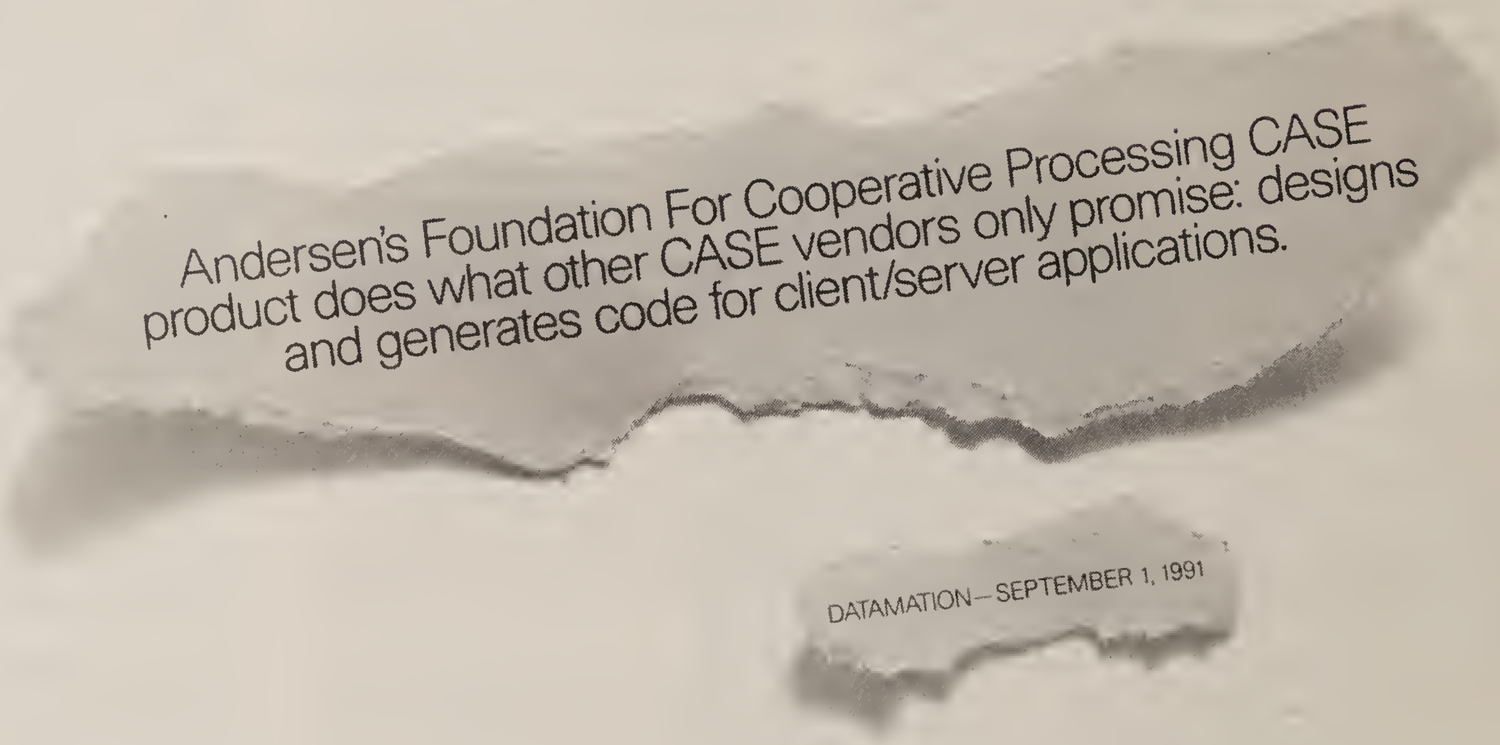

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Big bad bar code

Two-dimensional bar codes and advances in data collection technology promise to deliver more operational data to decision makers

J. Otto Seibold

BY KEVIN R. SHARP

A warehouse operator emerges from the shadows of a packed but deserted warehouse. He approaches the cavernous opening of a waiting tractor-trailer with both hands free, ready for anything. The driver of the truck extends a business card emblazoned with a mysterious two-dimensional checkerboard pattern. The warehouseman stretches out his hand, points his finger at the business card, and a laser beam from the back of his hand extracts the information stored in the checkerboard-printed bill of lading.

The computer on the operator's belt digests the 1,500-character bill of lading and does a quick check through data on back-ordered material. The check confirms that the newly arrived package is No. 553, which is needed for that night's critical shipment. The display on the warehouseman's forearm tells him exactly where to take the badly needed box.

While the scene above may appear a bit melodramatic when compared with the reality of daily operations in a distribution center, the technologies making the scenario possible are not exaggerated. Two-dimensional bar codes, small portable scanners and sophisticated conveyor belt monitors are either currently available or in the final stages of field testing.

Advances in bar code and closely related data collection technologies enable businesses from warehouses to hospitals to chemical processing plants to couple their operations more closely with their operational data. These advances stem from miniaturization of optics and processing electronics and more densely packed bar-code labeling techniques.

Current bar codes

The mysterious checkerboard bill of lading carried by our fictitious delivery driver contains a new, 2-D bar code that promises to pack a lot more data in the same space that current bar codes occupy.

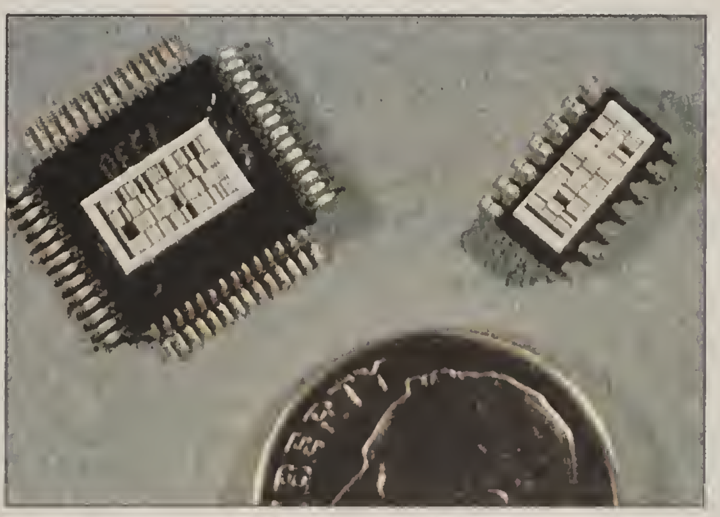
The 1-D bar codes now in use in commercial, retail and industrial applications encode all information along a single line. The thicknesses of the bars and spaces carry information, while the height of the symbol makes manual scanning easier because the human arm tends to scan a bar code in an arc, not a line.

Exactly what information can be encoded and how it is conveyed along the line varies between different bar-code "symbologies," that is, the languages of bar codes. For example, Code 39, the most common industrial bar code, codes all capital letters, all numbers and some special characters such as dollar signs and decimal points. Each Code 39 symbol consists of a start pattern, a variable number of symbol characters and a stop pattern. Each symbol character consists of five dark bars and four light spaces. Exactly three elements (bars and spaces) are wide; the rest are narrow, which makes every character exactly the same length.

One-dimensional bar codes work fine when the amount of required information transmission is low. This is the case for most "license plate" applications in which the bar code contains an index into a database but the real information is contained elsewhere. For example, a 1-D bar code might encode a purchase order number, while the list of items ordered remains in a database. The purchase order number would be used to access the information.

As the amount of information needed on a bar-code label has risen with application requirements, industries have adopted labeling standards requiring many different bar-code symbols on the same label. The Automotive Industry Action Group labels, for instance, incorporate separate symbols for supplier, part number, destination and other information. When passing along lots of small bits of relatively unrelated information, this technique works fairly well. However, it gets

Continued on page 82



Two-dimensional bar-code labels *pack enough density to provide serial number traceability on semiconductor equipment*

Sharp is a registered electrical engineer, free-lance writer and data collection consultant in Tucson, Ariz. He is also technical editor of *ID Systems Magazine*.

Continued from page 81

cumbersome as the symbols pile up.

Many separate bar codes on a label means an operator must perform many separate bar-code scans. It also means either the operator has to scan the data in the correct order, or the data entry software needs to accept the information in any order and sort it out later. Labels more than 6 in. on a side are common.

If a company needs to communicate larger packets of closely related information, such as a shipping manifest, the 1-D architecture breaks down. While it might be theoretically possible to make a label with enough Code 39 symbols to convey a 1,500-character bill of lading, the label would require almost 100 bar codes, the operator would need to scan each one and not miss any, and some technique would be required to break the message into separate symbols and reconstruct the message after scanning. Packing 100 Code 39 symbols on a label essentially uses the entire surface of the label to convey information.

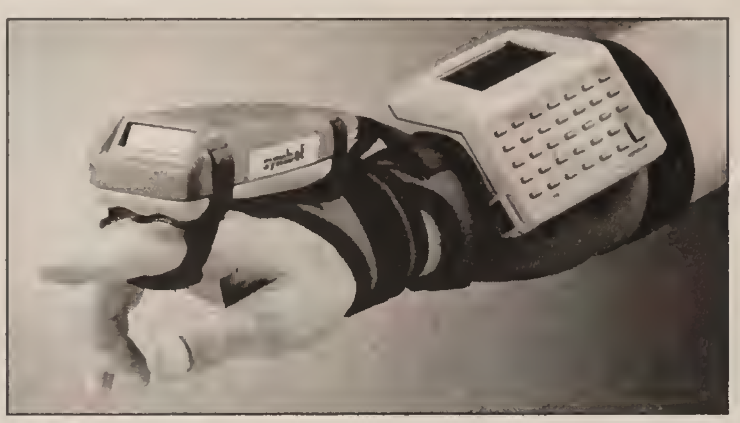
2-D to the rescue

Two-dimensional bar codes, on the other hand, enable users to pack a lot of information in a small space by stacking a series of independently scannable bar-code lines into a rectangular symbol. Each line contains a portion of the message contained in the block. PDF417, a symbology that will be available by the end of the year, packs an 1,800-character shipping manifest into a square symbol less than 2 in. on a side. Another symbology, Code 16K, is currently available and packs over 100 ASCII characters per sq in. (see story page 83).

The health care industry, for one, is now adopting 2-D bar codes for labeling unit dose medicine packages.

Two-dimensional bar codes contain data, not just indexes. So instead of merely containing an index of purchase orders, 2-D bar codes actually contain the records associated with the purchase order. This eliminates the need to look up additional information in the database.

This architecture has particular advantages for applications in which extremely large databases contain very few records needing access at any one time. A medical alert card could contain an entire allergic profile of a patient, accessible by a paramedic in remote areas without access to a central database.



The APS 3395 *from Symbol Technologies enables workers to track production but keep both hands free. Raising the finger activates a trigger and scans bar code*

Large direct-mail operations are also experimenting with 2-D codes to help them eliminate the need to support huge databases. These operations often receive demographic information about every person appearing on large mailing lists they purchase. These lists often contain millions of names, each with a few hundred bytes of profile data. A lot of these names are useless, because all the mailing operation cares about is profiles of people who respond to their mailings.

With standard bar codes, the direct-mail companies assign the cards they send out a bar-coded serial number, storing millions of profiles while waiting for replies. With 2-D codes, these companies print the profile on the return card and delete or summarize the records from their central files after the mailing. They still get the information they want, without having to support large databases. By the end of 1992 or early 1993, 2-D capabilities should become standard among bar-code printer and scanner vendors.

A receiving operation today . . .

- Incoming driver gives receiving manager bill of lading and purchase order number.
- Receiving manager goes to CRT terminal, calls up file with data on ordered materials and downloads to handheld unit.
- Receiving clerk enters each received product and quantity into handheld terminal. Program in terminal checks results. If product has bar-code label, it is used for identification. Otherwise, clerk must identify product and print bar-code label.
- Clerk records location of each product he puts away by scanning bar code on storage rack.
- After clerk puts away order, he returns terminal to receiving manager. Terminal contains list of every product received, quantity and product location in warehouse.
- Information is uploaded into main warehouse computer through same CRT terminal used to load purchase order file. Products now available for distribution.

. . . and in the future

- Warehouse clerk meeting driver wears, not carries, portable terminal. Wasted movements storing and retrieving terminal are eliminated.
- High-density bar codes convey not only an index into the warehouse's database but also a complete list of products being delivered. No need to walk to CRT to download list.
- Automatic bar-code scanners, feeding information to a conveyor system, sort incoming products, shuttling them either to right storage location or directly to an outbound truck or waiting assembly line.

Source: Kevin R. Sharp

CW Chart: Janell Genovese

Data collection strides

In the description of the warehouse operator at the beginning, the operator's hands were free yet the operator was able to scan the 2-D bar code. Miniature optics, highly integrated semiconductor chip sets and a heightened sense of the importance of ergonomics are giving rise to data collecting and processing personal computers that users wear instead of carry.

Typical portable bar-code terminals require one hand to hold the terminal and one to hold and operate the scanner. Loading and tracking a box with these units requires the operator to juggle the terminal, the scanner, holders for each device and the box.

Smaller optics are smoothing out this juggling act. Most handheld terminals now include built-in scanners. With the terminal and scanner as one unit, the operator needs only one holster, and scanning a bar code requires only one hand. Such freedom of movement helps during inventory counts of small parts, when one hand can lift parts and the other can scan.

The traveling PC

Wearable computing equipment takes the ergonomic concept one step further. In mid-1991, Park Engineering Associates, Inc. in Spokane, Wash., introduced the CompCap, a 1-pound IBM PC-compatible machine. The user wears a soft headband, which holds a small eyepiece in front of one eye and a microphone for voice input. The wearer sees a CRT display when looking into the eyepiece, with a belt-mounted PC making the whole setup portable.

A shipping clerk reads the purchase order number into the microphone. The speech processor in the unit processes the information, and a pick list appears on the eyepiece display. The unit carries a list price of $3,995 in single-unit quantities.

Symbol Technologies, Inc. in Bohemia, N.Y., also recently introduced a wearable bar-code scanning system (see photo above). Code-named "Gladiator," the unit consists of a bar-code scanner, a small display/keyboard and a belt-mounted, 16-bit DOS-based computer and utilizes radio communication.

The 5-ounce bar-code scanner straps on the back of either hand; the user literally points at a bar-code symbol to scan it. Not only does the setup provide freedom of movement for the operator, but Symbol claims it may also cut down on repetitive motion injuries, which can occur with a more typical finger-pulling scanning motion.

The 8-ounce keyboard/display straps on the forearm just above the scanner, and cabling from the two units connect them to the 2-pound belt pack.

Products should begin shipping by the end of the summer, with the complete package of scanner, display/keyboard, belt and computer starting at $3,690. McKesson Drug Co.'s Spokane, Wash., distribution center operators are testing the product [CW, May 11].

Losing the human touch

Developments in automatic conveyor belt scanners allow a warehouse to operate virtually without human intervention. An automatic scanner must read bar codes regardless of the orientation between label and scanner, because by the time a bar code reaches a scanner, it is often impossible to predict the direction it will be facing.

Most fixed-station scanners perform omnidirectional scanning by using mirrors to reflect a single laser beam through a very fast, complicated crisscross pattern. The object of this operation is to pass a beam through any possible bar code. While the technique is successful at reading bar codes on packages, in order to increase performance, it needs faster beams, better mirrors and quicker processors to analyze the reflected light.

Over the last couple of years, improvements in laser scanners have concentrated on software techniques instead of faster optics.

The cost of computing power has dropped faster than the cost of optics, and the new software approaches make the most of available computing power.

Several overhead scanning companies are able to assemble bar-code reads from a collection of partial scans. Let's say a bar code contains a total of 100 bars and 100 spaces (for convenience's sake, let's refer to these as elements 1 through 200). As the bar code moves past the scanner, one pass of a laser beam may

For future reference

Automatic Identification Manufacturers, Inc. (AIM USA)
Pittsburgh, Pa.
(412) 963-8588
A bar-code trade association that offers a free directory of bar-code literature, audio tapes, reference materials and technical papers. Sponsor of bar-code trade show Scan-Tech '92, Oct. 6-8.

Data Capture Institute, Inc.
Duxbury, Mass.
(617) 934-7585 or (800) 733-7592
David J. Collins, president
Research, consulting and publishing firm devoted to supporting users of bar-code and related data capture technologies. Includes Data Capture Press, which provides educational services and seminars and publishes books and newsletters. Published Using Bar Code — Why it's Taking Over *(by David J. Collins and Nancy N. Whipple, $32.95 plus shipping).*

Quad II, Inc.
Charlotte, N.C.
(800) NOW-CODE
Scott Cardais, Rick Bushnell,
Co-founders
A research firm that answers questions from bar-code users, provides in-house training and sells books and videos.

Uniform Code Council
Dayton, Ohio
(513) 435-3870
Hal Juckett,
Executive vice president
Offers seminars, including UPC Orientation Seminar (June 23) and UPC User Conference (Sept. 16-17).

pick up elements 1 through 60. Because these elements contain a valid bar-code start code, the software knows it got the first part of a bar code.

Another laser beam pass might pick up elements 30 through 90. Pattern matching algorithms in the scanner match up the first elements of the second scan with the last elements of the first scan and assemble a partial symbol now containing 90 elements. This pattern matching continues until the scanner detects a stop code and the scanner reports a good read.

With this technology, a bar code is still readable even though it may have been cut into pieces, then glued onto a page. Bar codes with dark ink lines through them can be read with this technique as can bar codes that are so long or so short they might not have ever been scanned by a single beam.

In distribution applications requiring millions of labels a year, decreasing the label height, and therefore its cost, is a critical goal. One of the first companies to market this technology, Accu-Sort Systems, Inc. in Telford, Pa., calls its reconstruction technique "DRX" scanning. The technology is available on scanners ranging from about $5,000 to $30,000.

Video scanning options

Everett, Wash.-based Intermec Corp. recently took a different tack in high-speed conveyor scanning when it introduced the 7110 scanner based on solid-state imaging technology. Instead of analyzing reflected laser light to detect a bar code, this scanner floods a package with white light and focuses the image on a linear charge-coupled device (CCD) similar to the sensors in home CCD camcorders. The sensor captures a momentary image of a line across a package as the package moves past the scanner. Successive lines are assembled into a 2-D gray-scale image of the package.

Each horizontal slice through a 1-D bar code contains exactly the same information. While a scanning laser beam cannot take advantage of this redundant information, a video scanner can. Signal processing algorithms in video scanners look for the average width of an entire bar, instead of trying to determine its dimension from a small sample. Damaged or dirty bar codes impossible for lasers to decipher can be read with video scanners.

The technology also interprets 2-D bar codes, reads many different bar codes on the same label and reads bar codes up to 20 times as long as they are tall.

For unattended scanning, the 7110 can read 2-D bar codes regardless of orientation.

Video scanning does have a drawback for industrial applications. Its short depth of field (about 1 in.) means the variation between the nearest and farthest package scanned can be no more than an inch. In flat-package postal sorting (for which the 7110 was originally designed), such a restriction poses no problem because the thickness of these packages varies less than an inch. In many industrial scanning applications, however, the thickness of the package varies a foot or more. These applications currently cannot utilize video scanners.

Scanning and bar-code advances in the next several years will go a long way in ensuring that staff can easily access information about products and shipments with the wave of a hand. The image of the deserted warehouse and mysterious warehouseman isn't that far-fetched. •

Packing a page of info into two inches

Two-dimensional bar codes are emerging as a way to get more data into a small space

BY KEVIN R. SHARP

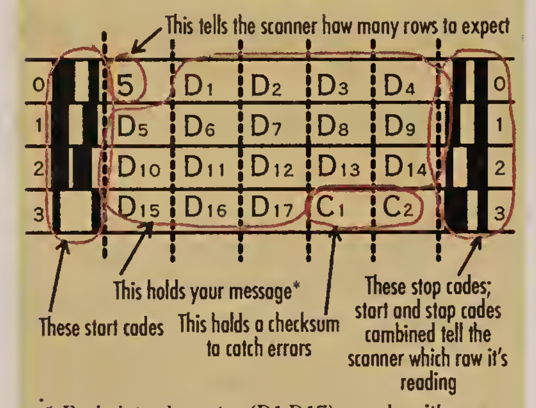
Symbologies are formal, standardized descriptions of techniques used for encoding information in a bar code. Here's a description of the two most promising 2-D symbologies, Code 16K and PDF417.

▸Code 16K

Code 16K was designed specifically for marking small products with big part numbers, regardless of industry. It enables the marking of products with manufacturing information such as lot number and expiration and the marking of individual items instead of classes of items. For example, a semiconductor manufacturer could put a different serial number on every microprocessor shipped, instead of just identifying the processor model number.

Code breakdown

What a typical code 16K structure looks like and what it tells the scanner


This tells the scanner how many rows to expect
0
1
2
3
5
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
C1
C2
This holds your message*
These start codes
This holds a checksum to catch errors
These stop codes; start and stop codes combined tell the scanner which row it's reading

** Each data character (D1-D17) encodes either one character or two digits. So the above code may read as follows (read left to right):*

	P	A	R	T
N	U	M	B	E
R	12	34	56	78
90		66		

Each Code 16K symbol block contains from two to 16 uniquely identified horizontal rows, each row consisting of a start character, five symbol characters and a stop character (see chart above). Only the symbol characters carry user information; the start and stop characters identify the symbol's boundary and the row number.

Code 16K's combination of start and stop characters uniquely identifies the symbol row, allowing a bar-code reader to scan rows in any order and properly assemble the entire symbol.

Each row contains five symbol characters between the start and stop characters. The first symbol character in the first row encodes the total number of rows in the symbol block. The last two symbol characters in the last row are check characters used to catch decoding errors. The remaining seven to 77 characters (two to 16 rows) contain information such as part and serial numbers, expiration dates, etc.

The quantity of user information conveyed in a Code 16K symbol depends on the type of information and its configuration. Each symbol character maps to one of three data character sets, depending on the current "mode" of the symbol. The idea of a "mode" is analogous to a mode on a keyboard, with one key standing for a "7" in the unshifted mode, and the same key standing for "&" in shifted mode. Two Code 16K modes convey one ASCII character per symbol character (the full 128-character ASCII set), while a third mode contains two digits per symbol character.

Keeping to the keyboard analogy, think of the digit mode as a system of two character phrase keys. Thus, a 16-row symbol may contain up to 77 ASCII characters or 154 digits. A 16-row symbol that is about 0.6 in. wide and an inch tall yields an effective information density of 128 characters, or 256 digits per sq in.

A standard 20-pin integrated circuit package has room for a two-row Code 16K symbol supporting 10^{14} unique numbers. With slight customization of a scanner and denser-than-normal printing, the label could easily grow to three rows, supporting 10^{24} numbers. That means a chip manufacturer producing 100,000 parts per second, 24 hours a day, 365 days a year and placing a unique three-row Code 16K serial number on each integrated circuit would not run out of numbers for more than 300 years!

▸PDF417

The PDF417 2-D symbology goes beyond putting big part numbers on small parts. "PDF" stands for portable data file, and the symbology specifically addresses moving large quantities of data between computers. It can essentially replace electronic data interchange (EDI) in some applications (see story below).

The "417" part of its name comes from its structure (see photo). Think of each PDF417 character as consisting of 17 boxes set in a long line. No visible lines surround the boxes. Now fill in some of the boxes so you have four bars and four spaces, each from one to six boxes wide.

Almost nothing about PDF417 works like standard bar codes. For one thing, there is not necessarily a direct correlation between the printed characters you see and specific data characters encoded. Numeric data, including binary files, are encoded in the base 900 number system. By converting digits (base 10) and binary numbers (base 256) to base 900, some data compression is achieved. A different compaction technique packs two ASCII characters into each PDF417 character.

The result of different data compaction techniques is that the amount of data conveyed in a PDF417 symbol depends on the type of information conveyed. Each PDF417 code word encodes either two printable ASCII characters, about 1.2 bytes of binary data (including 256-character ASCII strings) or approximately 2.95 digits. Each symbol block packs up to 1,850 printable characters, 1,108 bytes or 2,725 digits. That's equivalent to putting all the information on a typical 8.5- by 11-in., single spaced, typewritten page into a 2-in. square symbol.

A PDF417 row can shrink as short as 0.022 inches. Imagine a three-row PDF417 symbol on the edge of a circuit board. Such short rows remain scannable because PDF417 uses three different code character patterns, and no two adjacent rows use the same character patterns. In the middle of a scan, as the scanning beam cuts from one row to another, the scanner knows which code words belong in which rows. It is like a European traveler who notices a border crossing by noting the change in languages.

The PDF417 bar code *on this package can contain a packing list with more than 1,800 characters*

The scanner still needs eventually to read every character on every row; it just doesn't have to read an entire row with one sweep of a laser beam.

Shrinking the row height poses special symbol survivability problems, however. Because the height of a linear bar code or a row of a stacked code such as Code 16K is taller, it does provide durability. If dirt or abrasion damages a portion of the symbol, another portion can be scanned. In linear codes, at worst, the user manually enters the information. Dirt and abrasion more easily renders a short PDF417 row unreadable. No user wants to hand-enter 1,000-plus characters.

To compensate for the short rows, all PDF417 symbols contain two error detection code words, plus a user-selectable number of error correction code words.

All this data compaction provides data densities for PDF417 symbols of about 300 code words (360 bytes) per sq in. at standard print densities.

Good things come in small codes

The PDF417 symbology opens up data communication options for companies and trading partners. In certain cases, it can act as a substitute for EDI.

This symbology packs over 1,100 bytes of data into a symbol less than 2 in. on a side. A company requiring EDI from all vendors could allow a bar-code substitution for small volume trading partners.

These vendors could print bar-coded shipping manifests, purchase orders, advance ship notices and other electronic documents and then fax or express them to the trading partner. This information could then be scanned in.

While not as efficient as true EDI, such a technique presents a less burdensome option for small vendors that do not have adequate computing support capacity, while not unduly affecting the operations of the receiver of the optical data files.

The cost for such a transaction is about 30 cents; a symbol can be printed for less than five cents each, and a fax costs about 24 cents domestically.

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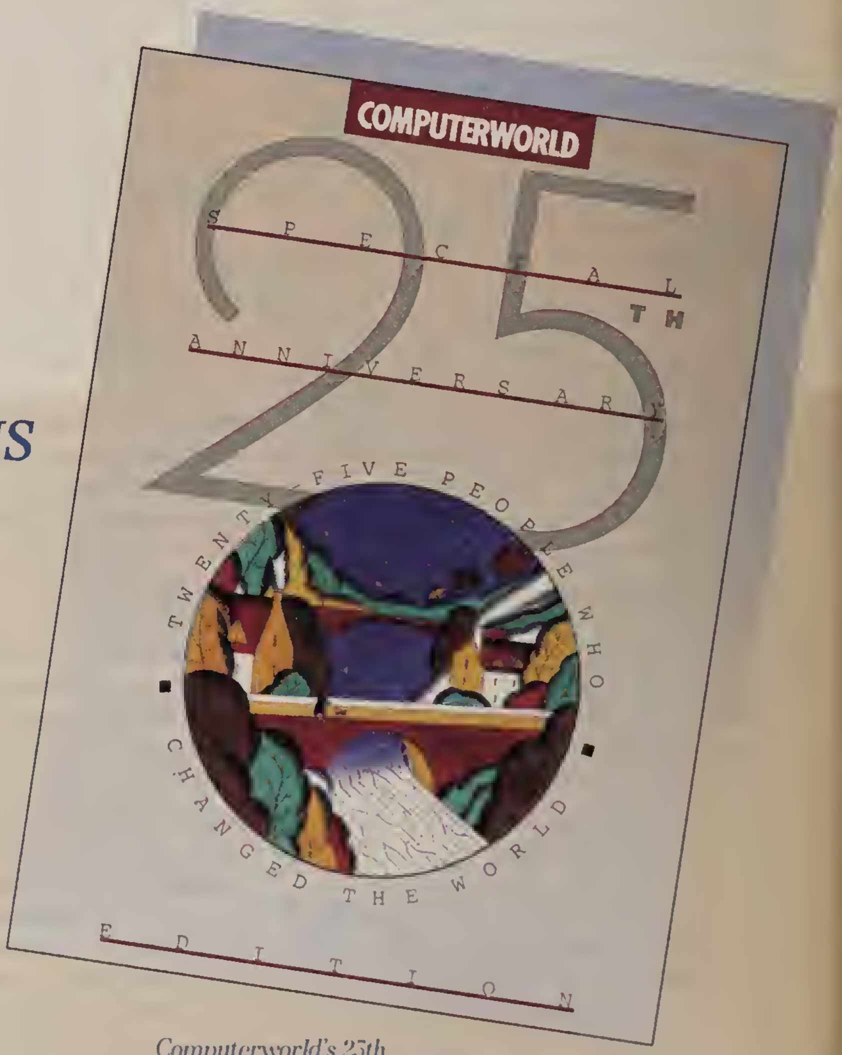

Computerworld's 25th Anniversary Issue Supplement, June 22, 1992

On June 22, Computerworld celebrates 25 years of Leading IS by bringing you a very special commemorative issue.

In one-on-one interviews with Computerworld editors, 25 industry legends speak out on their visions of the future of computing:

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Gordon Bell	Designer of the VAX
Dan Bricklin	Inventor of the Electronic Spreadsheet
Ted Codd	Relational Database Management Guru
Seymour Cray	Supercomputing Pioneer
J. Presper Eckert	Inventor of the Eniac, First Commercial Computer
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Bill Gates	Founder of Microsoft
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Andrew Grove	Co-founder of Intel
Max Hopper	Head of American Airlines' SABRE Reservation System
Kathy Hudson	Kodak IS Outsourcing Pioneer
Steve Jobs	Co-founder of Apple Computer
Philippe Kahn	Founder of Borland
Mitch Kapor	Founder of Lotus
Alan Kay	Xerox PARC Pioneer, Credited with Inventing the PC
James Martin	Data Processing Guru of the '70s
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MANAGER'S JOURNAL

THE CEO VIEW

High-tech exec? On the contrary!

Chicago bank CEO counsels management to make cautious technical investments for the best yields

BY ELLIS BOOKER
CW STAFF

Alex J. Pollock does not have a computer in his office; he says he can't imagine how owning one would help him as chief executive officer and president of the Federal Home Loan Bank of Chicago. A moment later, however, Pollock is speaking knowledgeably and eloquently about information technology as it relates not only to the running of his own $11 billion financial institution but to the larger world of finance, where "we deal in markets which themselves couldn't exist without the substrata of computing technology."

Such paradoxes delight this intellectual contrarian, who has published extensively on financial and management issues, including how management can leverage information technology.

Pollock's writings and the charts and formulas he has created to drive home his arguments derive from his earlier life.

He embarked on his banking career in 1969, has taught college-level philosophy courses and, in the mid-1980s, spent a year as a principal at Nolan, Norton & Co., a management consulting firm specializing in computer technology.

Pollock joined the Federal Home Loan Bank of Chicago last October.

■ On why he doesn't use a computer:
"I'm a great believer in their incredible power and contribution . . . but not in my job. The job of general management has extremely little to do with analysis of numbers.

"Overwhelmingly, the important work of the world is verbal. My father, a wonderful consultant, had a saying: 'If it's in the book, it's too late.' "

■ On the significance of computing technology for a bank:
"Computer systems apply to every single part of the organization in some way. What's a financial organization? It has next to no physical reality — that's why it's philosophically interesting. [A bank] is about *ideas* of financial value, of credits and risks.

"Everybody thinks banks are about money. What banks are really about is knowledge and information. That is, people and systems working together.

"Underneath it, of course, you have the bookkeeping system. Think about a financial transaction and how many computers systems it triggers. [Computers] help us understand all this philosophically fascinating abstraction.

"I picture a financial organization as [being] like the double-helix DNA molecule. In one strain is knowledge and information in human minds; data and information in computing machines is in the other."

■ On why he doesn't believe in the title "chief information officer":
"First of all, the name is so stupid. Think about all the forms in which information comes. Nobody can be the chief information officer because there's too much information.

"Nolan, Norton had a better name for the job: computing functional executive.

"The idea that you should have an executive who is extremely well-versed in the function of computing and its application in the firm is a great idea. Now, where does that executive have to be? That's more open."

■ On IS as it is used at Federal Home Loan:
"If you look at the Home Loan banks over the sweep of time, the financial sophistication is orders of magnitude greater and really couldn't exist without [information] systems.

"This is an approximately $11 billion bank. We're also extremely high-quality — rated triple A by both Moody's and Standard & Poor's. There are 12,000 banks and 2,000 savings and loans in the U.S. How many [banks] do you think have this rating? Fourteen. Of those, 12 are the Federal Home Loan banks.

"We also have an exceptional [ratio] of assets to people. We have 110 employees. That's $100 million in assets per employee. A typical commercial bank with those kinds of assets would have 3,000 or 4,000 employees.

"This is our most special characteristic: You have to have extremely tight control. . . . There is a lot of money moving around. Systems are one thing that helps us [keep control].

"Moreover, we deal in markets which themselves could not exist without the substrata of computing technology.

"We are floating on a sea of automated processing.

"Take the mortgage bank securities market, which was created 15 years ago and is now over $1 trillion. It could not exist, period, without these systems."

■ On the vulnerability of the worldwide financial system, now so dependent on an electronic web of networks and computer applications:
"The financial system is probably the most highly automated sector of the world. What's the state of this system? Well, it's got terrible problems. There's data, there's information, there's knowledge, and then there's wisdom. No question but that technology allows great crunching of data. However, there's a huge problem — one that every data processing man-

Continued on page 86

Michael Abramson

The CEO: *Alex J. Pollock, 48; bachelor's degree cum laude from Williams College, 1965; master's degree (philosophy), University of Chicago, 1966; M.P.A. (international relations), Princeton University, 1969.*

The career: *President and CEO of Federal Home Loan Bank of Chicago, 1991-present. President and CEO of Community Federal Savings, 1988-90. Managing director, Nolan, Norton & Co., 1988. Other senior management positions with Marine Bank NA and Continental Illinois National Bank.*

Accomplishments: *Spearheaded Community Federal Savings' turnaround from insolvency and demoralization to a bank marked by activist, disciplined management, revitalized marketing and sales, boosted morale, stabilized deposits and balanced interest rate risk.*

INSIDE

▶ The Vendor Partnership and Outsourcing Interests Group holds its first meeting. Page 87.

▶ Calendar. Page 88.

High-tech exec? On the contrary!

CONTINUED FROM PAGE 85

ager knows about — in getting from data to information.

"How do we get to knowledge, let alone wisdom? I'm not sure I have the answer, but I'm sure it's the right question.

"[In the '80s] we managed to have a gigantic bust, just as big as any bust they ever had before any computer existed. So, it's probably the case [that] we haven't achieved better knowledge of risks and returns."

■ **On using information systems to differentiate in the marketplace:**
"What a CEO has to do, in conjunction with the management team, is decide what you want computer technology to do for you.

"The discussion I want to have is NOT what box to buy. The discussion I want to have is what's it going to do for us, so we get a return on what we spend on it.

"How are we going to control this potentially interesting, very expensive stuff, which has a high potential both for doing something good and for wasting a ton of money?"

■ **On the value of a "defensive" IS strategy:**
"Where competitiveness is the issue, top management has to decide whether to use technology offensively or defensively. In finance, the overwhelmingly right answer, I think, is a defensive strategy.

"Defense is tremendously important. That doesn't mean you don't have to be current — but that's probably the necessary rather than the sufficient condition.

"I'm a great admirer of Gen. Sherman — clearly the most innovative strategic thinker of the Civil War. Sherman, you know, was a banker.

"His strategy was described as a 'strategic offensive combined with a tactical defensive.' You want to make the other guy attack you because that's a much stronger position.

But strategically, you want to be moving in such a way that you'll gain ground."

■ **On the illusion of buying strategic advantage:**
"First, you're all buying the same computers, and the trend is to buy software. So if you're going to develop software, you have to ask yourself: 'Do I truly believe that out of the 14,000 U.S. financial institutions, not even counting Wall Street, I somehow have analysts and programmers who can do this better?'

"I think it would take a bold bank manager to claim that. Also you have to remember, any software company that sells you a system will be happy to walk across the street and sell it to your competitor.

"I haven't heard yet where you're going to do something that few or none of your competitors can replicate."

■ **On technologies to watch:**
"I think there are tremendous productivity possibilities with [document] imaging. But again, in my view this is still fundamentally defensive and has to do with not falling behind.

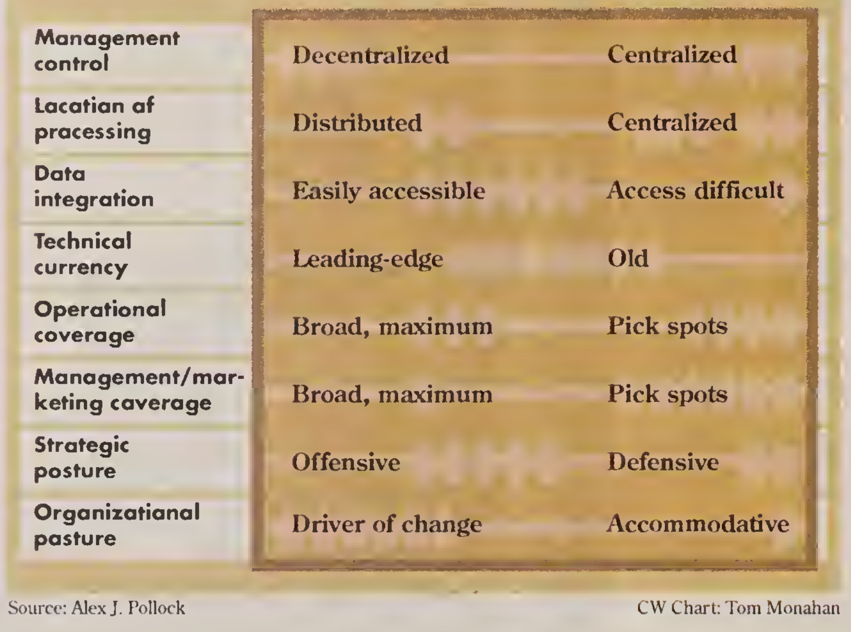
"Knowledge-based systems have a lot of potential. . . . I'm still a believer.

"Like anything else there's the expectations vs. the reality, but a number of these systems are now functioning in finance. They have always been thought of as a natural for credit and trading systems."

> "HOW DO WE get to knowledge, let alone wisdom? I'm not sure I have the answer, but I'm sure it's the right question."
>
> ALEX J. POLLOCK
> FEDERAL HOME LOAN BANK

Pollock's abacus

Alex J. Pollock, Federal Home Loan Bank of Chicago's CEO, sees IS and business management priorities as poles on an abacus — and the smart CEO, he says, will keep the beads moving according to the needs of the firm and its customers



Management control	Decentralized	Centralized
Location of processing	Distributed	Centralized
Data integration	Easily accessible	Access difficult
Technical currency	Leading-edge	Old
Operational coverage	Broad, maximum	Pick spots
Management/marketing coverage	Broad, maximum	Pick spots
Strategic posture	Offensive	Defensive
Organizational posture	Driver of change	Accommodative

Source: Alex J. Pollock

CW Chart: Tom Monahan

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EXECUTIVE TRACK

F. Robert Kurimsky, an 18-year veteran of Philip Morris Cos., has signed on as a consultant to Chicago-based systems integration firm **Technology Solutions Co. (TSC)**. Head of information systems at Philip Morris from 1974 to 1985, Kurimsky went on to serve the huge tobacco, brewing and food conglomerate as vice president of corporate IS until his retirement last month. He will provide TSC with insight into management and technology issues facing consumer products firms.

……

RJR Nabisco, Inc.'s **Nabisco Foods Group** has named **Donald N. Barksdale** as director of sales IS. Barksdale joined the company as a financial systems project manager in 1988.

Outsourcing buyer, be aware

Outsourcing users advised to learn from vendors' negotiating skills

BY NELL MARGOLIS
CW STAFF

ATLANTA — Outsourcing users in search of a shortcut to contracting smarts do not have to look any further than across the bargaining table, according to Harry Glasspiegel.

"Emulate your vendors — at least, the good ones," Glasspiegel told information systems executives from some 20 user companies who gathered earlier this month for the first official meeting of the recently formed Vendor Partnership and Outsourcing Interests Group.

A partner in the Washington law firm of Shaw, Pittman, Potts & Trowbridge — which has represented users in some of the high-profile outsourcing megadeals of the past several years — Glasspiegel warned users against overlooking outsourcing vendors as an invaluable repository of the negotiating savvy users need to develop — and fast.

"Large user institutions that may be incredibly sophisticated in all kinds of ways are still, more often than not, first-timers when it comes to the process of evaluating and negotiating an outsourcing deal," he added. "Vendors have been there many times before."

That disparity, Glasspiegel said, was the thrust of talk at the meeting of the fledgling group, launched earlier this year by Los Angeles-based Key Consulting Group, Inc. and neighboring consulting firm DuWayne Peterson Associates.

Support group

The group was formed to offer a forum for peer-to-peer inquiry and education among IS and business executives at companies that are eyeing outsourcing and firms that have already opted for it.

However, Glasspiegel added, user firms have more to learn than to fear from experienced vendors. For starters, he said there are two key lessons users stand to gain from emulating the vendor's approach to outsourcing: Form a team and take the time.

According to Glasspiegel, IS executives are ill-advised to negotiate alone. Delegates from a firm's financial and legal departments, as well as from IS and senior corporate, should work together, bringing their various perspectives to bear on the outsourcing scene.

But they should not expect to wrap it up quickly. Users "have a tendency to underestimate the complexity and time it will take to have a full and complete discussion," Glasspiegel said.

IN BRIEF

IS services tax attacked

- Sen. Melissa A. Hart (R-Allegheny) last week introduced legislation in the **Pennsylvania Senate** that would repeal the state's sales tax, enacted last year, on computer programming, data processing, systems integration and other computer services.

Hart pointed out that Pennsylvania is the only state to have such a tax. "Its continuation will clearly impair our competitive position," she said.

- **American Express Co.**, in a landmark agreement with the state of New York's attorney general, earlier this month agreed to notify more than 20 million cardholders that it compiles computerized profiles of individual spending habits — not just a mailing list — for merchants' use in targeted marketing campaigns.

Cardholders must be given the option of having their records excluded from the marketing database rented to merchants.

In addition, Robert Abrams, the state attorney general, proposed a state law that would apply the same rules to all credit card issuers.

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Securing Your Networks. San Antonio, June 8-10 — Contact: Philip Chapnick, CSI Conference Registration, San Francisco, Calif. (415) 905-2626.

A/E/C Systems '92. Dallas, June 8-11 — Contact: Gay Baker, Eddyville, Ky. (502) 388-2878.

Focus '92. Denver, June 8-12 — Contact: Marissa Gotta, J. D. Edwards & Co., Denver, Colo. (303) 488-4663.

Creating and Maintaining Customer-Focused Organizations. New York, June 9-10 — Contact: The Conference Board, Inc., New York, N.Y. (212) 339-0290.

Autodesk Expo '92. Dallas, June 9-11 — Contact: Autodesk, Inc., Sausalito, Calif. (415) 332-2344.

LotusWorld. Boston, June 9-11 — Contact: Jan Collins, Brodeur & Partners, Inc., Waltham, Mass. (617) 894-0003.

Self Maintenance Users Conference. Minneapolis, June 9-11 — Contact: Dataserv, Eden Prairie, Minn. (612) 829-6226.

Networking for the '90s. Toronto, June 10 — Contact: Rogers Data Services, Markham, Ontario. (416) 513-5087.

VantageExpo '92. Bedford, Mass., June 10-11 — Contact: Imaging Technology, Inc., Bedford, Mass. (617) 275-2700.

EO/IR Sensors. Washington, D.C., June 10-12 — Contact: Advanced Technology International, Dept. EO/IR, Washington, D.C. (202) 223-8840.

Developing Successful Outsourcing Agreements. Chicago, June 11-12 — Contact: Data Tech Institute, Clifton, N.J. (201) 478-5400.

JUNE 14-20

The Partnership Conference. Chicago, June 14-17 — Contact: Donna Dilbeck, Life Office Management Association, Meetings Department, Atlanta, Ga. (404) 951-1770.

Current Issues in Managing Information Technology. Cambridge, Mass., June 15-18 —Contact: Center for Information Systems Research, Cambridge, Mass. (617) 253-8967.

Supercom '92. Chicago, June 15-18 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

Replitech International Conference. Santa Clara, Calif., June 16-18 — Contact: Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

MacHack '92. Ann Arbor, Mich., June 17-19 — Contact: Conference Management by Expotech, Inc., Grosse Pointe Park, Mich. (313) 882-1824.

The Second Annual Manufacturing Leadership Summit. Cambridge, Mass., June 18-19 — Contact: Jean Hey, Management Roundtable, Boston, Mass. (617) 232-8080.

Tutorial Week '92. Los Angeles, June 18-20 — Contact: Dave Oppenheim, Los Angeles Tutorial Week Chair, Los Angeles, Calif. (310) 397-2546.

JUNE 28-JULY 4

Database World. Boston, June 29-July 1 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Leading the Transformation of Information Systems. San Francisco, June 29-July 1 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

JULY 5-11

Informix Worldwide Users Conference. San Jose, Calif., July 8-10 — Contact: Jaye Prosser, Informix Public Relations Group, Menlo Park, Calif. (415) 926-6316.

IS Financial Management Annual Conference. San Francisco, July 8-10 — Contact: Terence Quinlan, Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

JULY 19-25

ComNet. San Francisco, July 20-23 — Contact: Matt Mandino, World Expo Corp. (800) 225-4698.

Object World '92. San Francisco, July 20-23 — Contact: Lynn Fullerton, World Expo Corp. (800) 225-4698.

QuarkXPress Users Conference. New York, July 22-23 — Contact: QUI, Salem, N.H. (603) 898-2822.

JULY 26-AUG. 1

The Managing Enterprise Networks Conference. Boston, July 27-29 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

PC/Canada. Toronto, July 28-30 — Contact: The Interface Group, Needham, Mass. (617) 449-8938.

AUG. 2-8

Fed Micro '92. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Fose CD-ROM and Multimedia Conference & Exposition. Washington, D.C., Aug. 5-6 — Contact: Sylvia Griffiths, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

AUG. 23-29

Auto-Tech. Detroit, Aug. 25-27 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

SEPT. 20-26

Image World. New York, Sept. 21-25 — Contact: Benita Roumanis, Knowledge Industry Publications, Inc. (914) 328-9157.

Virtual Reality '92. Westport, Conn. Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

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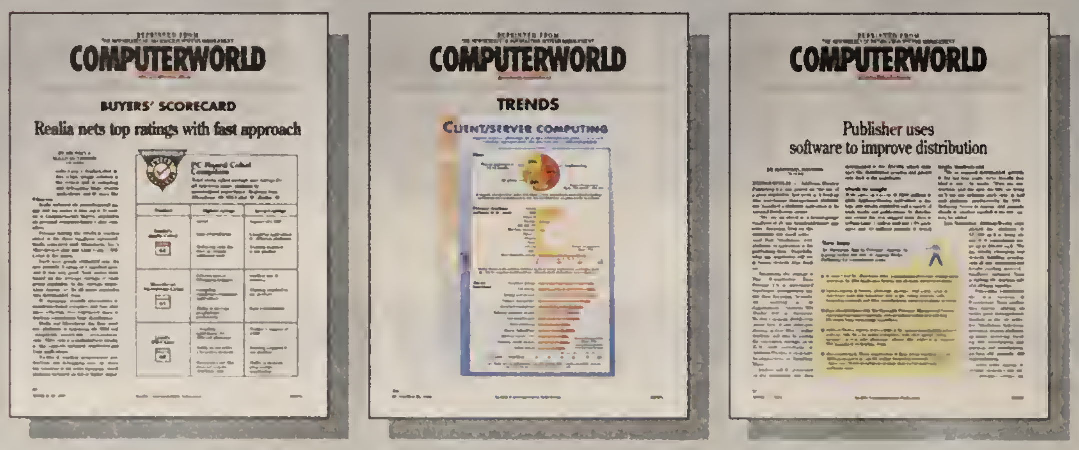
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Chairman, International Data Group

Charles Wang
Chief Executive Officer, Computer Associates

Debaters:

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Author of "Computer Structures" and "High-Tech Ventures"

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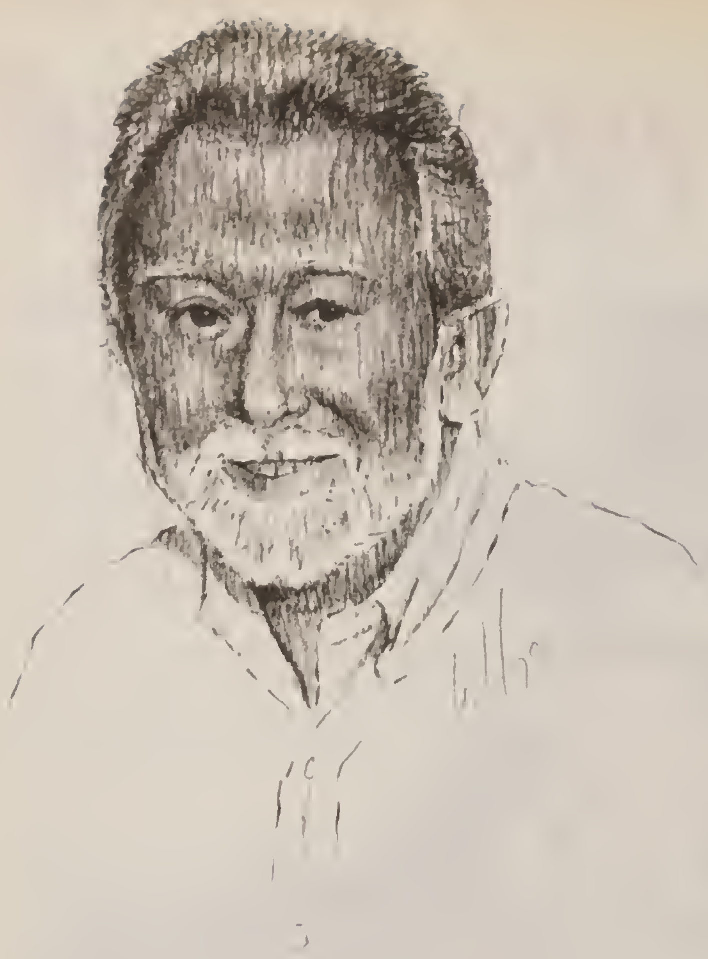

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- Bob Shields
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"And to us, national reach is key. Although Robert Shields & Associates is based in Houston, Texas, our membership in National Personnel Associates puts us in direct contact with over 300 affiliate offices all across the country. Experience has shown us that only Computerworld delivers the computer market nationally. No other publication even comes close.

"Since we do work such a broad market, we sometimes advertise in specialty publications as well. With Computerworld, however, we consistently get more responses - and higher quality responses - than with any industry or discipline-specific publication. Because these candidates are much more likely to have the right kinds of experience, typically 40+ percent of our total placements are a direct result of our Computerworld recruitment advertising.

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Laid off? Try captaining your own ship

BY DAVID BAUM
SPECIAL TO CW

It's the last Friday of the quarter, and the tension is so thick you could fly a kite in it: Revenue is down, expenses are up and everyone is feeling, well, dispensable.

This is a scene that plays itself out in high-technology companies around the country.

For many workers, that fateful Friday when they were "dispensed" has come and gone, and the unemployed can be heard asking, "What's next?"

Generally, anyone who has been laid off on short notice spends a week or two in a daze. There is a natural time lag while you adjust to your new routine — or no routine. Days pass as you read the want ads and become reacquainted with daytime television. But if you're like most people, you can probably handle only so many reruns of *Gilligan's Island* and *Flipper*.

Self-marketing

What you need to do is learn a few tricks about how to market yourself that will help you land temporary work on a contractual basis. "Even a one- or two-month project will give you the opportunity to demonstrate what you can do," says Chuck Burns, executive vice president at Walklett Burns, a software services company in Great Valley, Pa. More importantly, "it might turn into something long term," Burns says.

"The opportunities for contract programmers are very good these days for those who stay on their toes," says John Markel, president of SmartStar Corp., a software development company in Goleta, Calif.

"Many companies are running a lean staff to minimize expenses and will find themselves in a pinch if a project accelerates or business picks up suddenly," Markel says. "While such companies might be leery of building the staff back up immediately, they may entertain hiring temporary help."

Even if you don't land work as a contractor, it's an effective job-searching strategy. You'll introduce yourself to dozens of companies and will often find yourself directing your resume to key decision makers, rather than simply to a personnel file.

How does one get started as a contractor? There are six things you can do immediately:

- **Get on the horn.** Call or write to everyone you know and tell them you are starting your own contract business and offering services X, Y and Z. Do they need any help? Do they know anyone who does?
- **Don't overlook your former employer.** The company may quickly find that some of the work you were responsible for simply can't be done without you. Offer your services part-time on a contract basis.

Or perhaps there is some project you can do on your own time that will improve a product or procedure at your old place of work: a certain program or routine that no one ever had time to write. Do the preliminary design and offer it to your old manager or department for free. They may pay you to finish it.

- **Develop a professional image.** For a small investment you can acquire the essentials: business cards, stationery and envelopes.
- **Market yourself.** Start by writing a simple sales letter. Introduce yourself, give a brief description of your background, specialties and accomplishments and explain what services you offer. Say you are available for projects large and small and that you can quote your rates by the hour or by the job. You might close the letter by saying you will be happy to send a complete information kit to those who are interested.

Start by sending this sales letter to local companies. You can pinpoint those companies by looking through business directories, chamber of commerce listings and similar reference works, which may help you discover dozens of companies that could conceivably need your services.

Follow up with phone calls a week or two after mailing your letters.

- **Develop an information kit that you can send to those who request more information.** This should include your resume, a list of past clients and possibly a fee schedule.

The client list should include everyone you have worked for, particularly companies that will give you good references. You might be surprised at how many people and companies you can list as you think back through your career.

To determine your rates, start by figuring what your former salary was on an hourly basis and double it. Remember, you are now paying for all the benefits you once took for granted, including health care, vacation and sick leave.

> SEEKING CONTRACT WORK can be an effective way to job search, as you introduce yourself to dozens of firms and direct your resume to key decision makers.

You might also list a per diem rate and a monthly rate for extended projects.

You are now self-employed!

- **To make sure you have steady work, you'll need to continue to market yourself.** "Even the best assignments come to an end," Burns cautions. "It's important that you constantly market yourself for the next opportunity to avoid being left out in the cold."

Baum is an unemployed marketing specialist turned free-lance writer in Santa Barbara, Calif.

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Cross-training on the job builds skills

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles-based executive search firm specializing in the placement of computer professionals.

Q It seems that if you don't have experience in a skill set that happens to be popular at the moment — the acronym du jour, if you will — companies completely discount your general, fundamental, conceptual design experience. How can you convince people that you can learn a new skill set?

A With position vacancies at near record lows and a surplus of highly qualified people available, employers can hire people with the exact skill set that they need. Do careful research on what skills are in growing demand in your area and take advantage of any training opportunities to gain these skills.

If the skills you need cannot be gained at your current employer, consider moving to a position that will use your current strengths while providing such cross-training.

Q More than two years ago, I stumbled into a position administering a local-area network. I am now a network analyst responsible for a 100-node LAN that has grown into a small wide-area network.

I also do some report programming in RPG/400 on our midrange system. All my knowledge has come from on-the-job-training and seminars.

I consider myself very knowledgeable in my field. But without a technical education — my degree was in history — are my skills attractive in the marketplace?

A Certainly. Except for management and management consulting positions, computer science/MIS degrees are rarely a prerequisite, although they are generally viewed as a plus. With the job market likely to remain competitive for some time, I suggest you seek formal education in computers and business systems.

FAST TRACK
CAREER ADVICE
FOR THE '90s

Q There are a number of information systems jobs in manufacturing in my part of the country, but it seems that manufacturers always require experience in a manufacturing environment. Is there any way to present nonmanufacturing experience in a way that would be palatable to manufacturing companies?

A Your best approach depends on whether specific manufacturing experience is truly a hard requirement of the position. Most jobs involve three areas of expertise: applications, technical and interpersonal.

You should try emphasizing your relevant technical and interpersonal skills and draw parallels between your applications experience and the manufacturing industry.

Q I have worked in the IS department of a large bank for 12 years. The banking industry is declining, and I want to make sure that my next move is to a more stable industry. What do you suggest?

A Stable industries are those that are more recession-proof, such as the health care industry and the food industry. Regardless of the economy, people will still get sick, and people still have to eat. But job security in the 1990s will be more a function of maintaining skills that are in demand, rather than concentrating on a specific firm or industry.

Q I have been a mainframe programmer/analyst for eight years. Given current industry trends, I think I would be better positioned in a more PC-oriented position. How can I make the transition?

A Look inside your current firm for opportunities to gain personal computer experience in an area such as mainframe-to-PC connectivity. Seek additional training, either on the job or at school. Nurture relationships with people who can be influential in assisting your job shift.

If such opportunities do not exist at your current company, look for a mainframe position in another company with a commitment to PC development and open career paths.

☞*We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522 or send them by fax to Kelly Dwyer at (508) 875-8931. Questions may be edited for brevity and clarity. If we use your question, we'll send you a gift.*

JOB SNAPSHOT

AS/400 professionals

Job Snapshot is a monthly column that provides detailed information on selected job categories.

➤**JOB REQUIREMENTS:** Familiarity with the RPG/400 language is a plus. Experience in C programming and object-orientation is prized because IBM is working on improvements to the operating system to make it more object-oriented, one recruiter says. Database design skills and knowledge of personal computers and PC connectivity are also becoming increasingly desirable because the AS/400 is being used in more end-user situations.

➤**BEST EDUCATION:** Skills and experience are more important than formal education, although most AS/400 professionals have graduated from trade school or a two-year community college. AS/400 courses are offered by IBM and some third-party vendors, and attendees are often sponsored by firms. Because these courses are expensive for individuals, one recruiter suggests making an arrangement with someone you know who works on an AS/400 and learn to use it after hours.

➤**CAREER PLUSES:** Opportunities for AS/400 programmers are expanding as more firms jump on the downsizing bandwagon. Furthermore, because these jobs generally involve considerable direct interaction with the user community, AS/400 programmers wind up learning a lot about the business.

➤**CAREER MINUSES:** AS/400 shops are fairly small, on average, so you often have to be willing to be a jack-of-all-trades.

➤**AVERAGE SALARY:** For the AS/400 programmer/analyst with less than a year's experience, the national average salary is about $26,000, according to the 1992 38-400 National Salary Survey, which is conducted every six months by Nate Viall & Associates, a recruiting firm in Des Moines, Iowa. For those with a two-year degree, the range is $20,000 to $28,000; a four-year degree usually guarantees between $26,000 and $32,000. The national salary average for three years of experience is $34,000. At seven or eight years, the pay moves to more than $40,000. The free survey is available by calling the firm at (515) 274-1729.

➤**BEST OPPORTUNITIES:** There has been a growing need for AS/400 professionals in the manufacturing sector, and because manufacturing is popular in the Midwest, recruiters agree that Chicago is the hotbed for AS/400 opportunities.

Researched and written by Kelly E. Dwyer, assistant editor, features, and Kathleen Gow, a free-lance writer based in Medford, Mass.

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SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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The North Broward Hospital District, South Florida's most progressive and successful not-for-profit multi-hospital system, is seeking a Systems Analyst to join their Patient Care Information Systems team. The District consists of four acute care medical centers located in the Greater Fort Lauderdale area.

The qualified candidate will possess a bachelor's degree in Data Processing or related field, with four years of experience working with the selection, installation and maintenance of **Patient Care Information Systems.** This individual must be able to work independently to organize and manage major projects. PC skills (word processing and Lotus) are necessary. Programming, system design, development and re-engineering experience desirable.

The North Broward Hospital District offers a very attractive compensation and benefits package. For immediate and confidential consideration send resume with salary history and requirements to:

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FORT LAUDERDALE, FL 33316

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This position will provide user support in the HP North American Response Center's Predictive Program and Engineer Applications, provide user interface to new product development, plan and implement new product introductions, lead process improvement activities with the Predictive Program and assigned Engineer Applications.

Requirements include BSCS, BSMIS, or equivalent combination of education and experience. Electronics major field of study. 2 years experience in job offered or 2 years as customer telephone support engineer. (1) minimum 1 year HP experience with HP's Predictive Program and (2) minimum 2 years dealing with functionality, usage & support of HP's 3000 and 9000 systems, and (3) minimum of 1 year working experience with inter-company support processes/organizations. $45,000/year.

Qualified applicants should apply by resume to:

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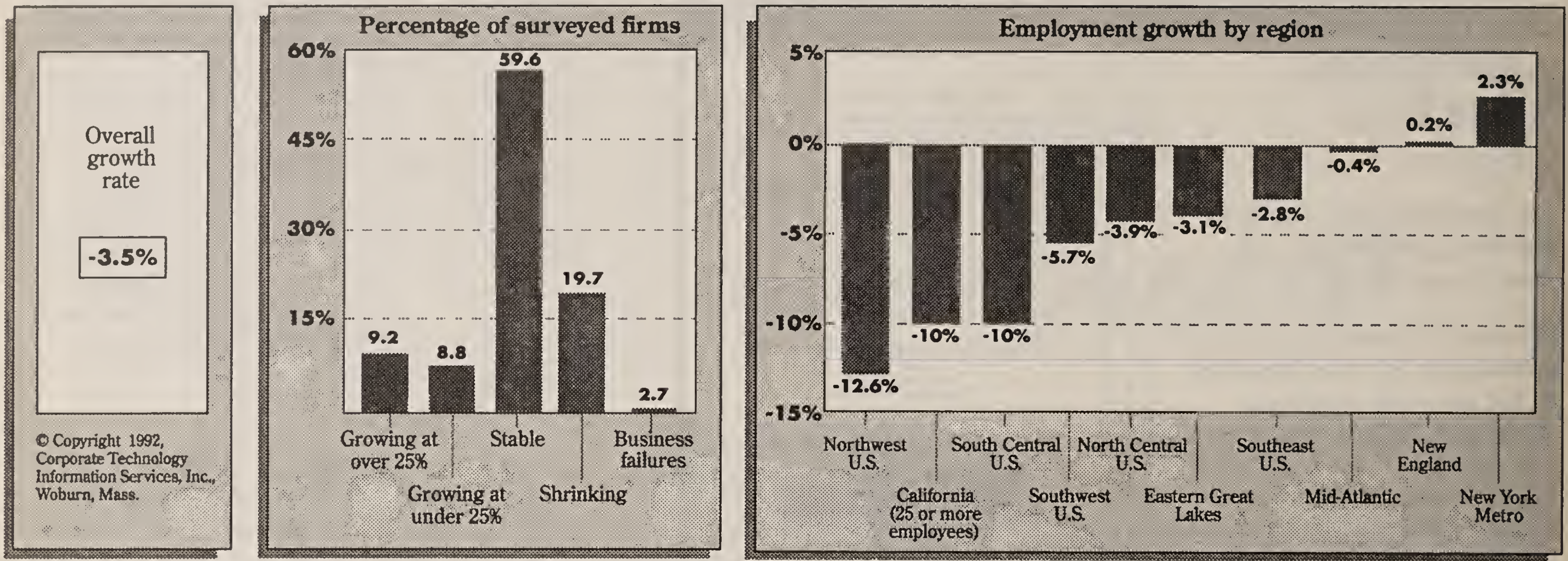
Computerworld/Corptech Career Index

MANUFACTURING EQUIPMENT — The 294 manufacturing firms surveyed by Corptech reduced their work force by 1,087 workers during the past year. The majority of jobs lost were in the West.



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Systems Analyst/Consultant: Plan, schedule & manage projects to develop commercial business solutions for wide variety of businesses & clients by use of electronic data processing equipment incl. IBM 3090, PRIME, DEC, & utilizing relational date base technology like DB2, INFORMIX, ADR DATACOM/DB & INFORMATION and utilizing 4GL's like CSP, IDEAL, INFORMIX & INFO-BASIC. Consult with users/clients to develop logical & physical design of commercial applications. Develop prototypes, program specifications & test procedures to develop commercial business systems. Establish documentation standards and document system prototype & details using DESIGN/1. Develop enhancements to existing business systems efter analyzing client's requirements. Evaluate case readiness for clients & propose use of case tools & state of the art workbench tools to meet client's requirements. Develop training procedures for use of CASE tools in client's premises. Conduct metric studies on commercial business systems & propose reengineering strategies for clients using case tools like RETROFIT & PATHVU. Re-engineer or reverse engineer existing commercial applications for clients. Consult & coordinate commerical application system development using workbench based tools like MICROFOCUS, COBOL, PC-CICS and XDB. Develop eutomated file transfer system using FT-XPRESS, CLISTs and Dialog Manager to facilitete comprehensive application system development on workbench based workstation platforms. REQUIREMENTS: Bachelors degree in Computer Science or Engineering. Must possess 2 yrs. exp. in the job offered or 2 yrs. exp. es Systems Engineer/Computer Programmer. Must possess 2 years experience in case tool evaluetion & selection, methodology development, installation of workstations with state of the art project manegement & workbench tools. Development of eutomated procedures for workstation based epplication; developing parts specification system for manufecturing industries using case tool (IEW/ADW) and application generators for target, CICS/DB2 environment, 40 hour work week. Hours: 8:30 e.m. to 5:00 p.m. Salary $45,220 per year. Must have proof of legal euthority to work permanently in the U.S. Interested applicants send two copies of cover letter and/or resume to: Illinois Department of Employment Security, 401 South State Street, 3 South, Chicago, Illinois 60605. Attention: E. Reed. Reference #V-IL4683-I. NO CALLS. An employer paid ad.

Programmer, 40hrs/week, 9:00am-5:00pm, $30,210/year. Progremming in COBOL and Assembly for applications such es order processing, accounts receiveble, shipping, general ledger and customer service in network environment Object-oriented programming. LAN troubleshooting. M.S. in Computer Science es well es one year experience as a Programmer or Research Associate required. Previous experience must include: COBOL, Ethernet, Assembly Graduate education must include one project with object-oriented programming. Must have proof of legal authority to work permanently in the U.S. Send **two copies** of your resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Attention: Jean Woodson, Reference #V-IL-5275-W NO CALLS. An Employer Paid Ad

Senior Systems Engineer. Analyze date processing requirements to determine electronic data processing system that will provide system capabilities required for projects or workloads, and plan layout of new system installetion or modification of existing system, utilizing knowledge of local area network (LAN), Netframe 400 Fileserver, IBM PS/2 Model 386 Workstations, SUN, Macintosh, end IBM Mainframe hardware, DOS Opereting System, Novell Netwere Network Meneger, C Programming Language and SQL Dete Base Control Languege; confer with dete processing end project manageriel personnel to obtain data on limitations and capabilities of existing system and capabilities required for data processing projects and workload proposed; analyze date to determine, recommend, end plan layout for type of computer end peripheral equipment, or modifications to existing equipment and system that will provide capability for proposed project or workload, efficient operation, and effective use of allotted space; specify power supply requirements and configuration, and recommend purchase of equipment to control dust, temperature, and humidity in area of system installation; participate in client training and support; perform computer virus protection procedures; enforce appropriete security meesures. Master of Science in Computer Science and 1 year, 6 months experience es Senior Systems Engineer or 1 year, 6 months experience es Program Consultant/Teaching Assistant required. Applicants must possess 1 year, 6 months work experience in microcomputer systems utilizing local area network (LAN), C programming language and DOS and UNIX opereting systems. Applicants must heve completed college-level courses in the following subjects: 1. Database Menagement Systems, 2. Artificial Intelligence, 3. Computer Grephics. 40 hours M/F, Overtime es needed, 7:30 a.m. to 4:00 p.m., $40,000 per year. Must heve proof of legal euthority to work permanently in the U.S. Send resumes with Social Security numbers to the Indiana State Employment & Training Services, 10 North Senate Avenue, Room 103, Indianapolis, Indiena 46204, Attention: Fey Glaspie. I.D. 3288259. AN EMPLOYER PAID AD.

SOFTWARE PROJECTS MANAGER - 40 hrs./wk., 8am-5pm, $60,000.00 per yr. To oversee and direct U.S. and offshore project planning, methodologies, product analysis, design and development, quality assurance and implementetion. Prepare proposals and project cost estimates. Coordinete and manage employee training. Requires e Master's Degree in Computer, Electrical or Mechanical Engineering or Management or Business Administration, 7 years expenence in job offered or 7 years experience as Project Leader. Experience must include: offshore project management; quality essurance and system migration on IBM platforms; manufacturing, accounting and imaging software; project methodology tools i.e. STRADIS or SSAD, IEW or JANUS; IBM NCR, ICL, QANTEL mainframes, MVS, UNIX, CICS, IMS, DB/DC, DB2, INGRES, ORACLE, SAA/CUA and NLS/DBCS software. 5 years overseeing design and development of software systems. Send resumes to: 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Ref. No.: 34392.

SOFTWARE ENGINEER. Design, implement and test networking software at both user and systems level. Develop system requirements end implement software using "C", UNIX-shell programming on Intel 386/486 based herdware running under various UNIX operating systems (UNIX system V, BSD UNIX end XENIX). Using NFS, SNMP, TCP/IP, UDP, ICMP and Link Level protocols, integrate networking software drivers into UNIX opereting system kernels. Develop test plans, exercise test and debug software to insure product quality. Analyze and report on performance measurement and reliability issues. Consult with systems designer, testers and customers. Some projects performed et client site in various geographic locations. Minimum requirements: M.S. in Computer Science. Courses required: 1) Computer Networking, 2) Operating Systems, 3) Software Engineering, 4) Theory of Algorithms. Must have completed a major project in: 1) design, implementation and use of network protocols (including TCP/IP and UDP), 2) design & implementation of network management softwere, 3) Throughput study of TCP/IP, et both user and system level, 4) software engineering methodologies in implementation and testing, 5) operating system internals. Must have one year experience in the position offered or one yeer experience as a Graduate Assistant. Assistantship must be in Computer Science and include use of "C" end UNIX. Resume required. 40+ hours per week, 8:30 a.m. to 5:30 p.m., $38,000 per year. "Must have proof of legal euthority to work permanently in the U.S." With resume (in duplicate) contect: Illinois Department of Employment Security, 401 S. State Street, 3-South, Chicago, IL 60605. Attn: S. Lindsey, Reference # V-IL-5387-L. NO CALLS. AN EMPLOYER PAID AD.

PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing epplications. Develop and implement systems interface including systems detabase and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with UNIX*, C, UNIX/SHELL Programming, X Windows, LAN Networking, Graphical User Interface Design and Structured Analysis and Design Techniques. Must heve Master's or completion of all academic requirements in Computer Science or Engineering or Math. Experience required is six months in job offered or six months es e Systems Analyst or Programmer or Graduate Assistant. Additionally experience must involve use of UNIX, C, UNIX/SHELL Programming, X Windows, LAN Networking, Graphical User Interface Design and Structured Analysis and Design Techniques. M-F; 40 hrs/week, 8:00-5:00; salary $36,000/year; Cary, NC location. Must have proof of legal authority to work in the U.S. J.O. #NC 7213908 and DOT Code 030.162-014. Apply to the nearest Job Service office, or send resume to Job Service, 700 Wade Ave., Raleigh, NC 27605. All resumes must include social security no. *UNIX is a tm of AT&T. EOE

PROGRAMMER-ANALYST: Design and implement software projects under IBM MVS environment using COBOL2, CICS (Customer Information Control System) and JCL. Design databases and processing systems with IBM's DB2 Detabase Management System using SQL language. Develop and implement applications in local area networks and mainframe communication networks. Provide project management and system development support to clients, using knowledge of Information Engineering and CASE (Computer-Aided Software Engineering) technology. Requirements: 1) M.S. in Computer Science; 2) Graduate education must include completion of one course each in Advanced Database Management (including Information Engineering), Advanced Data Communication, and External Data Structure, and research experience with CASE technology; and 3) 4 months experience in the job offered or 4 months as e Management Analyst Programmer; the required 4 months experience must include experience with COBOL2, CICS, and JCL. $33,000/yr. 40 hrs/wk. 8-4:30. **Must have proof of legal authority to work permanently in U.S.** Send 2 copies of Resume, Transcript, and Experience Letter to: Illinois Dept. of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, Attn: Brenda Kelly, Ref. #V-IL-5476-Q. No Calls. Employer Paid Ad.

Software Engineer-Scientific: Reseerches, designs, develops, and codes software packages for the materials charecterizetion and crystallography areas. Creetes graphical user interface & underlying scientific code to conduct scientific methematical computations required for X-rey diffraction analyses. Creates new crystallogrephic computation tools and performs customer support services. PhD or equivelent in Ceramic Science, Materials Science, Chemistry, or Physics; Hands-on exp. with the experimental & computational tools by x-ray diffraction analysis in single-crystal & polycrystalline; Proficient in Fortran, Professional Basic, DOS, Windows, C, & C++; need total of 4 yr. work, or work & ed. combined, exp. in algorithm development, graphics programming, & mini or micro programming with at leest 2 of the 4 yrs. performing the job or its equivalent (exp. to be proven by progrems written by epplicant); demonstrates ability to perform advance research through evidence such as publications in refereed scientific journals; 40 hrs.; $51,000/yr; Interview & Jobsite: Livermore, CA; Send this ad and your resume or letter of qualifications to Job #CP13617, P.O. Box 9560, Sacramento, CA 95823-0560 no later than 6/9/92.

SENIOR SOFTWARE ENGINEER - 40 hrs./wk., 8am-5pm, $45,000.00 per yr. To design, develop, test and maintain manufacturing end engineering epplication systems on the IBM 3090 and PC's utilizing CICS, DB2, IMS/DB, DCCS, JCL, VSAM and SDF software, COBOL II language and MVS/XA operating system. Requires Bachelor's Degree in Computer, Electrical or Mechanical Engineering, 2 years experience in job offered or 2 years experience as Systems Analyst. Must have experience in design and programming of vehicle engineering systems and with IBM 3090, CICS, DB2, SDF, COBOL, JCL and VSAM. Send resumes to: 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Ref. No.: 34792.

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Entergy Services, Inc., the technical service subsidiary of Entergy Corporation, has an opening for a Database Analyst at its New Orleans location.

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The current environment consists of two IBM 3090/400's supporting production applications in IMS DB/DC and CICS/DB2. Future applications will also be developed in an MVSESA/UNIX/Sybase distributed architecture. A minimum of 2 years experience in Database Administration is required, preferably with experience in an IMD DB/DC environment. A Bachelor's degree or equivalent experience is needed.

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- A minimum of five years related experience.
- Knowledge of software development life-cycles.
- Proven software design and development skills.
- Experience with RDBMS design, management and implentation (Sybase preferred).
- Adept with "C",Unix or VMS, SQL.

(Positions available in New York, Boston , Northern New Jersey, Chicago, Atlanta, Washington, DC and San Francisco. Most positions require U.S. citizenship.)

SYSTEMS CONSULTANTS

Sybase systems consultants act as partners to the business team in technically qualifying and closing sales opportunities by delivering pre-sales technical support to sales representatives and management. Requirements:
- Five years experience in the field.
- Proven performance in technical sales support.
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- Experience as a "C" programmer.
- Outstanding trouble-shooting skills.
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Manager of Recruiting
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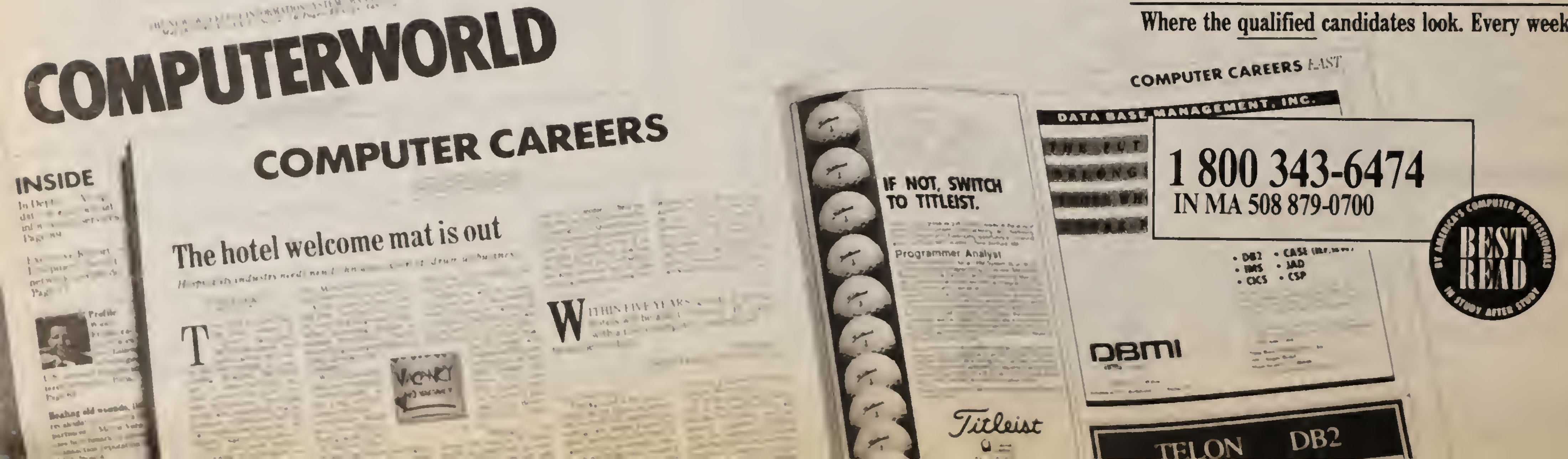

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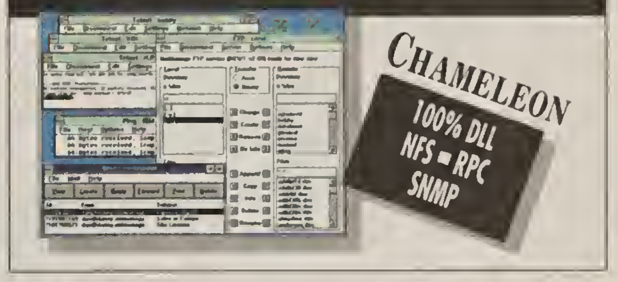

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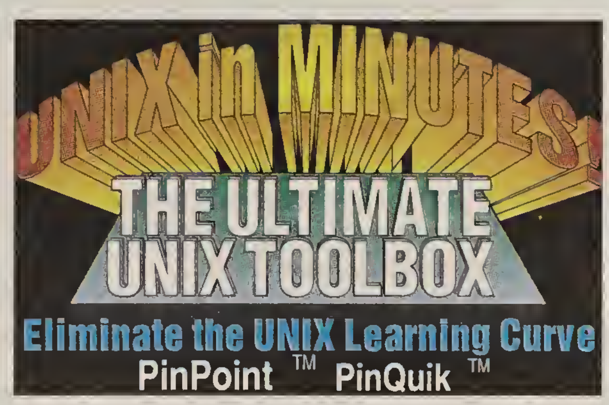

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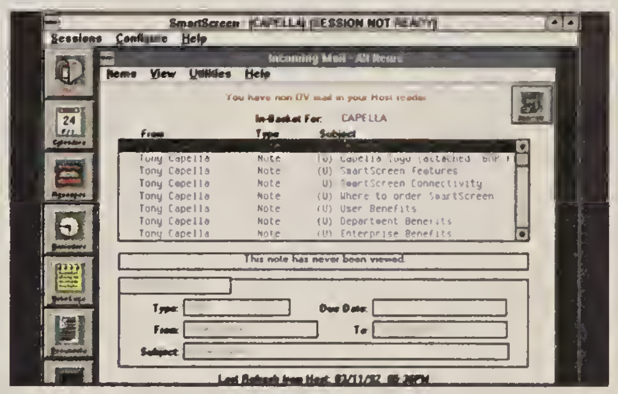

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MARKETPLACE

Top LAN connection questions

What you always wanted to know about networking but were afraid to ask

When it comes to networking, there is no end to the questions you could ask. Just to clear away some of the more common ones, we asked consultant Jill Huntington-Lee to lay some answers on the table.

Q Are smart hubs really necessary?

A An intelligent wiring hub, or concentrator, allows you to segment the network into manageable chunks — making it easier to isolate problems, enforce security and keep track of configuration changes.

Also, when workgroups are moved or reorganized, a local-area network administrator can make all necessary changes at one location — the wiring closet — once the hubs are in place. However, smart hubs may not be worth the investment if you're installing a small network with a homogeneous topology.

It will cost between $80 and $200 more per port to set up a hub-based LAN; however, the long-term savings in LAN administration and troubleshooting may outweigh the costs in less than two years.

Q What should I look for in a network management system?

A Don't lock yourself into a proprietary solution. Look for compatibility with Simple Network Management Protocol (SNMP) so you can manage other vendors' equipment. Most commercially available SNMP software packages will start at several thousand dollars and run as high as $50,000 for Unix-based packages supporting artificial intelligence.

F.Y.I.

You can pick up some useful tips on networking from Internet mailing lists. To subscribe, send a request to one of the following electronic-mail lists:

- big-lan-request @suvm.acs.syr.edu
- info-appletalk@ andrew.cmu.edu
- nfs@tmc.edu

Don't be lured by fancy graphics: They require more expensive platforms and can be tiresome to view. The user interface should be easy to master, however. Look for red flashing icons that get your attention rather than a pure command-line interface with nonstop messages.

If you're integrating the management of a global network of LANs and wide-area networks, investigate the new "enterprise management" solutions, which cost from $150,000 to several million dollars.

Q What type of wiring is best for installing a LAN in a single building?

A Guidelines for structured wiring usually recommend shielded twisted-pair (STP) or data-grade unshielded twisted-pair (UTP) for host-to-desktop connectivity. In the backbone riser system connecting building floors, the guidelines recommend either ThinWire, fiber or coaxial cable.

Connecting workstations, printers and the like with coaxial cable is generally avoided today — twisted-pair is easier to install and costs less per foot. Used with a structured wiring (hub-based) configuration, twisted-pair accommodates orderly growth and is more manageable.

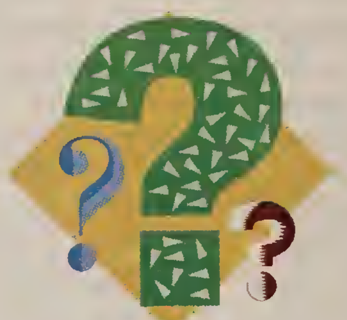
Q What type of cabling is best for connecting buildings on a campus-size LAN?

A The preferred choice is running single-mode or multimode fiber trunks between buildings. Since the costs for pulling and terminating cabling are greater than the cable itself, a rule of thumb is to install enough cable to support three or four times the bandwidth needed. If you can afford it, pull both single and multimode fiber at the same time.

Q Will I always save money by using existing UTP instead of STP?

A That depends on your environment. Existing voice-grade UTP (ordinary telephone wire) is definitely unsuitable in "noisy" environments where electrical interference from manufacturing operations, fluorescent lights, elevators and even office equipment may garble data transmissions.

Even if noise is not a problem, your existing wiring scheme may not be well-documented, and you'll end up paying the cable installer extra money for the time it takes to match wire pairs.



Data grade UTP is less susceptible to noise, but STP is superior to both. According to UTP fans, however, STP is more expensive, harder to work with and not worth the trouble.

But keep in mind while there are benefits to both of these approaches, mixing the two is not a solution because they are not compatible.

Q When should I use a router instead of a bridge to connect LANs?

A Generally speaking, the larger and more complex the network, the more likely it is you need a router. Bridges are sometimes faster, but routers handle complex tasks such as load balancing, diverse routing and isolating different traffic types to appropriate LAN segments.

Bridges connect LAN segments by forwarding all packets not addressed to the local LAN. Each new LAN segment means more extraneous traffic, as packets travel around trying to find their final destination. This chews up a lot of bandwidth on long-distance links to remote LANs.

In contrast, routers recognize various protocols and can filter traffic based on protocol type, application and other criteria. Routers can create "firewalls" between networks to isolate "broadcast storms" that can crash a network.

They can also support redundant links for disaster recovery purposes. The downside is that routers are more complex to configure and install and are susceptible to crashing when reconfiguration occurs.

Huntington-Lee is principal at Brandywine Network Associates in Cinnaminson, N.J., and a member of IEEE and the Association for Computing Machinery. Her MCImail address is 446-3809.

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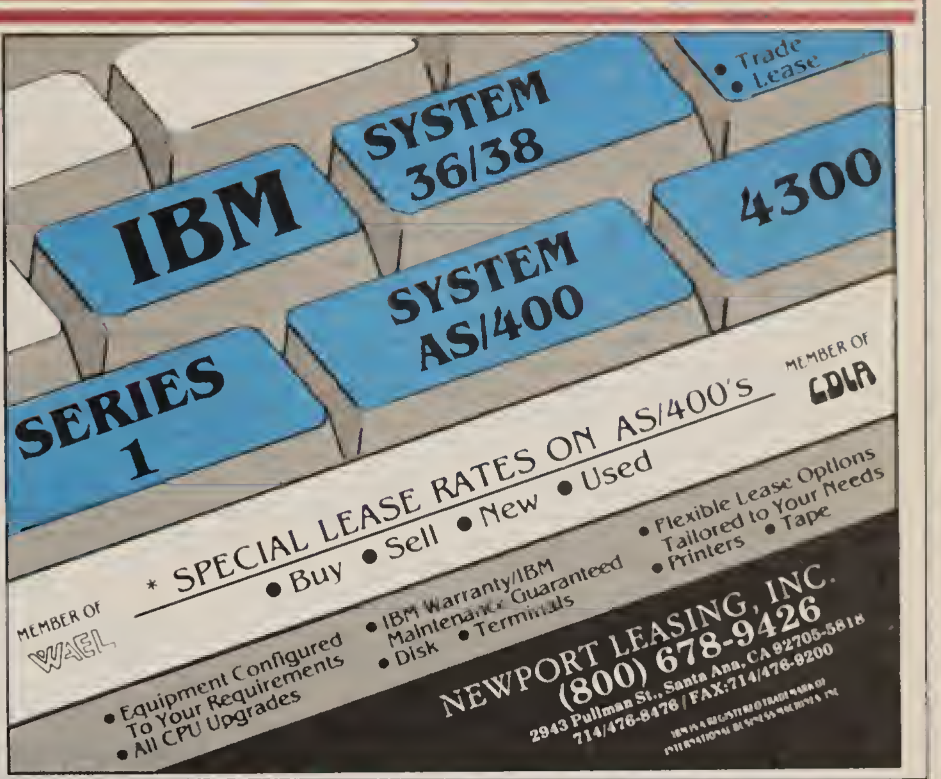

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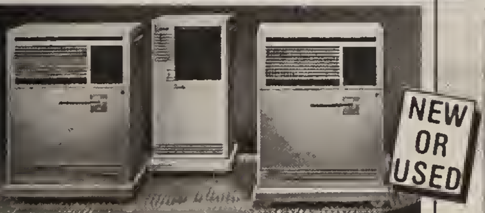

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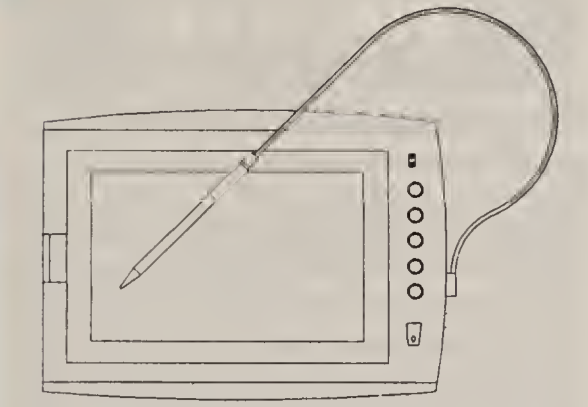

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	Closing price	Ask	Bid
IBM AT 339	$500	$700	$250
PS/2 Model 30 286	$500	$900	$300
PS/2 Model 35SX	$1,525	$1,600	$800
PS/2 Model 55SX	$1,200	$1,300	$800
PS/2 Model 60	$600	$900	$325
PS/2 Model 70	$2,650	$2,800	$1,200
PS/2 Model 80	$1,900	$2,100	$1,100
PS/2 Model 95	$4,200	$4,600	$3,300
Compaq Portable II	$425	$500	$375
Portable III	$550	$650	$250
Portable 386	$1,700	$2,125	$1,000
SLT-286	$700	$900	$400
LTE-286	$900	$1,100	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$1,800	$2,000	$1,100
Apple Macintosh Classic	$875	$1,050	$700
SE	$775	$875	$600
IIX	$2,800	$3,250	$2,000
IICI	$3,200	$3,600	$2,460
IIFX	$4,200	$4,900	$3,700

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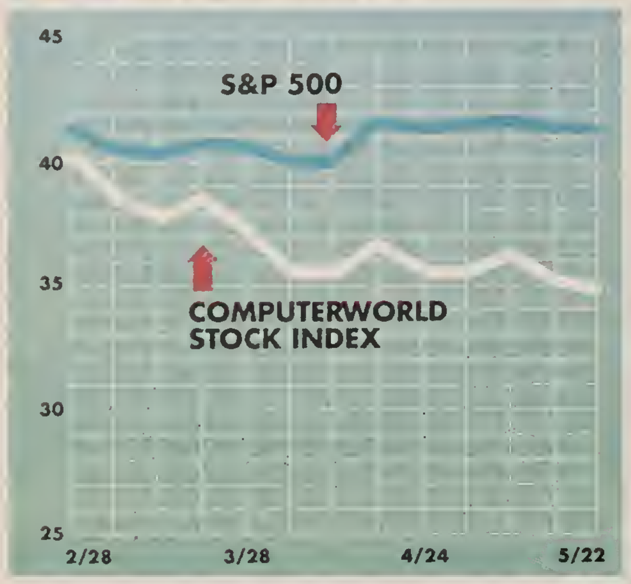

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	Bear, Stearns & Co.	Salomon Brothers, Inc.
Amdahl Corp.	Avoid	Outperform
AT&T	Strong buy	Outperform
Control Data Corp.	Buy	Not rated
Cray Computer Corp.	Not rated	Market performer
Cray Research, Inc.	Avoid	Outperform
Digital Equipment Corp.	Avoid	Market performer
Hewlett-Packard Co.	Hold	Outperform
IBM	Hold	Market performer
Pyramid Technology Corp.	Buy	Market performer
Sequent Computer Systems, Inc.	Hold	Market performer
Sequoia Systems, Inc.	Not rated	Outperform
Sterling Software, Inc.	Buy	Not rated
Stratus Computer, Inc.	Strong buy	Outperform
Tandem Computers, Inc.	Avoid	Outperform
Unisys Corp.	Hold	Not rated

Computerworld Friday Stock Ticker

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TOP PERCENT GAINERS

Printronix Inc.	38.89
Western Digital Corp.	14.29
Artel Communication Corp.	14.24
Autodesk Inc.	12.60
Parametric Technology	11.11
Chips and Technologies	10.61
Mips Computer Systems	10.29
Atmel Corp.	8.70

TOP PERCENT LOSERS

Software Toolworks Inc.	-34.88
AI Corp.	-18.52
Sequoia Systems Inc.	-10.94
Interleaf Inc.	-10.87
Proteon Inc.	-10.42
Storage Technology*	-10.37
Digital Systems Int'l Inc.	-9.09
Data General Corp.	-8.70

TOP DOLLAR GAINERS

Microsoft Corp.*	5.75
Autodesk Inc.	3.88
Parametric Technology	3.88
Computer Sciences*	3.75
Symantec Corp.	3.13
Xerox Corp.	3.00
Informix Corp.	2.25
Printronix Inc.	1.75

TOP DOLLAR LOSERS

Cabletron Systems	-4.00
Storage Technology*	-3.88
Digital Equipment Corp.*	-2.50
Policy Management Sys.	-2.38
Xilinx	-2.25
Wellfleet Communications	-2.00
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Sequoia Systems Inc.	-1.75

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OTC	15.00	6.75	3 COM Corp.*	12.00	0.88	7.87
NYS	65.75	55.75	American Info Techs Corp.*	63.00	-0.50	-0.79
NYS	44.63	32.88	AT&T*	42.88	0.25	0.59
OTC	4.25	1.13	Artel Communication Corp.	1.50	0.19	14.24
NYS	50.63	40.25	Bell Atlantic Corp.	43.50	0.00	0.00
NYS	52.63	43.38	Bellsouth Corp.	48.88	0.75	1.56
NYS	9.38	4.75	Bolt, Beranek & Newman	5.63	0.25	4.65
NYS	65.88	34.25	Cabletron Systems	43.75	-4.00	-8.38
OTC	31.00	11.75	Chipcom Corp.	22.00	0.25	1.15
OTC	43.63	14.63	Cisco Systems Inc.	41.25	0.38	0.92
OTC	35.25	13.75	Compression Labs Inc.	16.75	0.00	0.00
OTC	4.25	1.25	Data Switch Corp.	1.50	-0.13	-7.69
NYS	23.63	12.38	Digital Comm. Assoc.*	19.75	0.75	3.95
OTC	19.00	8.50	Digital Systems Int'l Inc.	10.00	-1.00	-9.09
OTC	8.88	3.63	DSC Communications	4.69	0.31	7.15
OTC	10.88	4.88	Fibronix Int'l Inc.	5.50	-0.25	-4.35
OTC	37.50	13.75	Filenet Corp.	22.75	-1.75	-7.14
OTC	3.50	1.13	Gandalf Technologies Inc.	2.38	-0.19	-7.34
OTC	2.50	1.19	Gateway Communications	1.56	-0.13	-7.41
NYS	5.50	2.13	General Datacomm Inds.	4.00	-0.13	-3.03
ASE	5.88	0.50	Go Video	3.25	0.13	4.00
NYS	35.00	28.13	GTE Corp.*	31.75	-0.50	-1.55
NYS	70.63	50.00	ITT Corp.	64.63	-1.25	-1.90
OTC	36.13	25.25	MCI Commmunications Corp.	31.88	0.63	2.00
OTC	14.50	5.75	Microcom Inc.	11.25	-0.25	-2.17
NYS	18.25	8.25	Network Equipment Tech.*	14.88	0.38	2.59
OTC	25.50	6.75	Network General	18.75	1.00	5.63
OTC	20.00	8.50	Network Systems Corp.	9.25	0.00	0.00
OTC	17.88	5.50	Newbridge Networks Corp.	15.13	-0.25	-1.63
NYS	49.25	35.88	Northern Telecom Ltd.*	40.50	1.38	3.51
OTC	65.00	22.63	Novell Inc.*	50.50	0.25	0.50
NYS	82.38	68.13	Nynex Corp.*	77.00	-0.75	-0.96
OTC	37.50	16.50	Octel Communications Corp.	22.63	-1.38	-5.73
OTC	9.88	5.63	Penril Data Comm. Ntwks.	6.00	-0.13	-2.04
OTC	53.00	21.00	Picturetel Corp.	35.25	-0.50	-1.40
OTC	18.75	9.75	Proteon Inc.	10.75	-1.25	-10.42
NYS	19.75	11.63	Scientific Atlanta Inc.	19.38	0.63	3.33
NYS	66.00	49.38	Southwestern Bell Corp.	61.75	-1.25	-1.98
NYS	31.50	20.75	Sprint Corp.	24.75	0.00	0.00
OTC	37.75	14.25	Synoptics Communications	27.50	1.25	4.76
NYS	38.88	32.88	U S West Inc.	35.63	0.13	0.35
OTC	41.25	21.25	Wellfleet Communications	30.75	-2.00	-6.11

PC and Workstations Up 1.11%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
OTC	15.25	5.75	Advanced Logic Research	6.50	-0.38	-5.45
OTC	70.00	40.25	Apple Computer Inc.*	59.50	-1.13	-1.86
OTC	32.25	14.50	AST Research Inc.*	18.25	0.25	1.39
NYS	19.25	10.13	Commodore Int'l	11.75	0.25	2.17
NYS	38.75	22.13	Compaq Computer Corp.*	26.13	1.25	5.03
OTC	29.00	13.91	Dell Computer Corp.	26.00	0.50	1.96
OTC	7.75	3.00	Everex Systems Inc.	5.75	0.00	0.00
NYS	34.00	21.25	Harris Corp.	27.88	-0.75	-2.62
NYS	85.00	44.63	Hewlett Packard Co.*	77.63	0.25	0.32
OTC	17.63	7.38	Mips Computer Systems	9.38	0.88	10.29
NYS	29.75	13.25	Silicon Graphics	18.13	0.88	5.07
OTC	36.88	20.75	Sun Microsystems Inc.*	27.50	-0.88	-3.08
NYS	34.38	23.38	Tandy Corp.*	27.38	-0.13	-0.45
NYS	11.13	5.13	Zenith Electronics	7.88	-0.13	-1.56
OTC	25.50	7.75	Zeos International Ltd. (L)	9.75	0.50	5.41

Large Systems Off 2.52%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
ASE	20.63	11.63	Amdahl Corp.*	16.88	0.00	0.00
NYS	12.75	7.50	Control Data Corp.	11.88	0.13	1.06
NYS	19.25	8.75	Convex Computer (L)	9.00	0.00	0.00
OTC	19.63	2.88	Cray Computer	3.38	-0.25	-6.90
NYS	52.25	31.25	Cray Research Inc.*	31.25	-1.25	-3.85
NYS	22.50	7.88	Data General Corp.	7.88	-0.75	-8.70
NYS	71.75	41.63	Digital Equipment Corp.*	41.63	-2.50	-5.67
NYS	107.38	81.63	IBM*	91.75	0.13	0.14
NYS	127.50	93.50	Matsushita Electronics	106.50	1.00	0.95
OTC	26.25	10.25	Pyramid Technology (L)	10.38	-0.38	-3.49
OTC	17.88	7.50	Sequent Computer Sys.	11.25	-0.25	-2.17
OTC	18.38	10 13	Sequoia Systems Inc.	14.25	-1.75	-10.94
NYS	54.25	27.25	Stratus Computer Inc.*	45.88	0.88	1.94
NYS	17.63	9.50	Tandem Computers Inc.*	13.38	0.00	0.00
OTC	3.88	1.13	Tandon Corp.	1.56	-0.06	-3.82
NYS	11.75	3.38	Unisys Corp.*	9.13	-0.13	-1.35
ASE	7.50	2.00	Wang Labs Inc. (b)*	3.75	0.00	0.00

Software & DP Services Off 0.28%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
OTC	68.50	37.50	Adobe Systems Inc.	44.75	-0.50	-1.10
OTC	13.25	3.50	AI Corp.	5.50	-1.25	-18.52
OTC	54.50	19.00	Aldus Corp.	20.25	0.50	2.53
OTC	19.75	10.13	American Software Inc.	12.75	-0.25	-1.92
OTC	20.00	7.50	Ask Computer Systems	13 88	0.00	0.00
OTC	62.25	23 25	Autodesk Inc.	34.63	3.88	12.60
OTC	37.75	11.75	Bachman Info. Systems (L)	11.75	-0.88	-6.93
OTC	42.50	26.00	BGS Systems Inc.	34.75	0.00	0.00
OTC	79 00	35 00	BMC Software Inc.	46.75	1.50	3.31
OTC	20.50	8.75	Boole & Babbage	18.25	-0.25	-1.35
OTC	86.75	39.50	Borland Int'l Inc.*	45.75	1.00	2.23
OTC	11.25	4 50	CE Software	6.25	0.25	4.17
ASE	13 75	6.50	Cheyenne Software Inc.	11 88	0.38	3.26
OTC	20.38	7 25	Cognos Inc.	8 88	-0.25	-2.74
NYS	17.00	7.50	Computer Associates*	14 25	0.63	4.59
OTC	21.50	12.00	Comshare Inc.	13.75	0.25	1.85
OTC	47.88	15.00	Easel Corp.	25.50	-0.50	-1.92
OTC	19.50	9.25	Goal Systems Int'l	17.00	0.38	2.26
OTC	25.50	11.50	Group I Software	15.50	0.50	3.33
OTC	6.63	4.13	Hogan Systems Inc.	4.38	0.00	0.00
OTC	36.25	19.38	Information Resources	20.25	-0.50	-2.41
OTC	36.00	5.38	Informix Corp.	32.25	2.25	7.50
OTC	3.63	1.06	Intellicorp Inc.	1.75	-0.13	-6.67
OTC	30.25	16.25	Intergraph Corp.	16.50	0.00	0.00
OTC	15.00	4.88	Interleaf Inc.	10.25	-1.25	-10.87
OTC	20.25	7.75	Intersolv Inc.	15.00	1.00	7.14
OTC	33.50	10.50	Knowledgeware Inc.	11.00	-0.25	-2.22
OTC	45.25	20.25	Legent Corp.*	33.25	0.50	1.53
OTC	40.75	18.00	Lotus Development*	29.00	-0.38	-1.28
OTC	7.38	2.38	Meca Software	3.75	-0.13	-3.23
OTC	22.25	11.50	Mentor Graphics	13.25	0.25	1.92
OTC	20.50	6.50	Micrografx Inc.	16.00	-1.50	-8.57
OTC	133.25	60.50	Microsoft Corp.*	115.75	5.75	5.23
OTC	21.13	7.00	Oracle Corp.*	14.75	-0.63	-4.07
OTC	40.25	11.75	Parametric Technology	38.75	3.88	11.11
OTC	11.00	6.25	Phoenix Technologies	9.00	-0.38	-4.00
OTC	25.25	9.38	Platinum Technology	14.50	0.25	1.75
OTC	46.50	27.50	Progress Software Corp.	31.25	-0.75	-2.34
OTC	26.63	11.50	Quarterdeck Office Sys.	14.50	0.00	0.00
OTC	29.50	10.00	Rasterops	14.00	0.13	0.90
OTC	17.25	6.75	Ross Systems	8.50	-0.25	-2.86
OTC	26.25	12.00	Software Publishing Corp. (L)	12.00	-0.75	-5.88
OTC	8.50	2.00	Software Toolworks Inc.	3.50	-1.88	-34.88
OTC	7.25	1.75	Spinnaker Software	4.00	0.00	0.00
OTC	16.50	6.25	State of the Art	11.50	0.25	2.22
NYS	25.25	10.88	Sterling Software Inc.	17.25	0.75	4.55
OTC	30.00	14.25	Struct. Dynamics Research	18.00	1.00	5.88
OTC	31.75	15.00	Sybase Inc.	24.25	-0.50	-2.02
OTC	51.00	19.50	Symantec Corp.	39.88	3.13	8.50
NYS	15.50	7.25	Systems Center Inc.*	9.38	0.13	1.35
OTC	31.00	8.66	System Software Assoc.	27.00	0.50	1.89
OTC	23.75	18.50	Walker Interactive Systems	21.75	1.00	4.82
OTC	6.63	2.38	Wordstar	2.88	0.13	4.55

Semiconductors Up 0.58%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
NYS	21.50	8.38	Advanced Micro Devices	15.38	-0.13	-0.81
NYS	11.38	7.00	Analog Devices Inc.	10.00	-0.13	-1.23
OTC	18.88	6.75	Atmel Corp.	9.38	0.75	8.70
OTC	14.13	7.00	Chips and Technologies	9.13	0.88	10.61
NYS	22.63	9.00	Cypress Semiconductor Corp	9.50	-0.25	-2.56
NYS	10.25	6.25	Dallas Semiconductor	8.50	-0.13	-1.45
OTC	68.75	38.50	Intel Corp.*	48.50	0.25	0.52
NYS	10.63	6.25	LSI Logic Corp.	6.88	0.13	1.85
NYS	22.38	10.88	Micron Technology	14.00	0.00	0.00
NYS	83.75	54.00	Motorola Inc.*	78.63	0.13	0.16
NYS	11.50	3.88	National Semiconductor*	9.63	-0.13	-1.28
OTC	27.00	13.00	Sierra Semiconductor	16.00	-0.75	-4.48
NYS	40.50	26.00	Texas Instruments*	36.50	0.38	1.04
OTC	10.63	5.88	VLSI Technology	7.75	0.50	6.90
OTC	14.00	3.75	Weitek	4.88	-0.25	-4.88
ASE	5.00	2.00	Western Digital Corp.	5.00	0.63	14.29
OTC	32.50	19.25	Xilinx	23.75	-2.25	-8.65
OTC	11.50	4.25	Zilog Inc.	6.88	-0.63	-8.33

Peripherals and Subsystems Up 1.06%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
OTC	2.25	1.00	Apertus Technologies	1.56	-0.13	-7.41
OTC	10.00	2.75	Archive Corp.	7.38	-0.50	-6.35
OTC	24.00	11.25	Banctec Inc.	21.00	-1.50	-6.67
OTC	23.50	5.25	Cambex Corp.	12.75	0.75	6.25
ASE	14.38	7.00	Cognitronics Corp.	13.38	0.63	4.90
NYS	23.25	12.50	Conner Peripherals*	22.88	-0.25	-1.08
ASE	19.66	3.28	Dataram Corp.	15.38	-0.50	-3.15
NYS	16.88	4.88	EMC Corp.	14.50	-0.25	-1.69
OTC	9.38	4.75	Emulex Corp.	6.75	-0.63	-8.47
OTC	23.00	14.75	Evans & Sutherland	18.25	0.75	4.29
OTC	40.63	13.38	Exabyte	33.50	1.38	4.28
OTC	27.25	15.75	Intelligent Info. Systems	25.25	-0.50	-1.94
OTC	11.25	4.00	Iomega Corp.	7.00	0.13	1.82
OTC	34.75	14.50	IPL Systems Inc.	21.00	0.50	2.44
OTC	24.50	11.75	Komag Inc.	13.00	0.00	0.00
OTC	14.00	1.63	Maxtor Corp.*	12.50	0.38	3.09
OTC	15.25	5.50	Micropolis Corp.	10.75	0.63	6.17
NYS	98.75	83.50	3M Corp	94.38	-0.38	-0.40
OTC	8.75	3.50	Printronix Inc.	6.25	1.75	38.89
NYS	26.75	9.00	QMS Inc.	9.00	-0.25	-2.70
OTC	18.00	8.88	Quantum Corp.	14.75	-0.25	-1.67
OTC	12.25	5.00	Radius Inc.	10.63	0.38	3.66
NYS	12.88	5.88	Recognition Equipment	9.00	0.00	0.00
OTC	13.13	5.38	Rexon Inc.	12.00	-0.25	-2.04
OTC	16.88	7.13	Seagate Technology* (H)	16.13	0.25	1.57
NYS	78.00	33.50	Storage Technology*	33.50	-3.88	-10.37
NYS	30.88	16.00	Tektronix Inc.	19.50	0.38	1.96
NYS	82.25	51.50	Xerox Corp.	73.63	3.00	4.25

Services Off 2.16%

Exch	52-Week Range			May 22 Close	Wk Net Change	Wk Pct Change
OTC	27.25	16.25	American Mgmt. Systems*	23.00	-0.13	-0.54
NYS	5.38	2.88	Anacomp Inc.	3.88	-0.25	-6.06
OTC	19.00	12.00	Analysts Int'l	18.25	-0.25	-1.35
NYS	49.00	30.25	Auto Data Processing*	45.50	-0.38	-0.82
NYS	24.53	12.50	Comdisco Inc.*	14.50	-0.25	-1.69
OTC	13.50	7.75	Computer Horizons	9.25	-0.88	-8.64
NYS	84.88	52.25	Computer Sciences*	76.00	3.75	5.19
NYS	10.13	7.00	Computer Task Group	8.75	-0.50	-5.41
OTC	19.25	7.75	Corporate Software	14.25	-1.25	-8.06
OTC	30.75	12.75	Egghead Discount Software	22.25	-1.00	-4.30
NYS	33.06	23.00	General Motors E (EDS)*	29.38	0.38	1.29
OTC	30.38	8.88	Intelligent Electronics	11.25	0.38	3.45
OTC	14 88	2.50	Merisel	12 25	-0.88	-6.67
OTC	15.75	5.75	Microage Inc.	9 75	-0.50	-4.88
OTC	41.25	20.25	Paychex (H)	25.00	0.08	0.33
NYS	73.00	45.75	Policy Management Sys.	65.13	-2.38	-3.52
NYS	42.50	19.63	Reynolds and Reynolds	41.50	-0.75	-1.78
OTC	32.00	21.25	SEI Corp.	28.50	-0 13	-0.44
OTC	24 38	17.00	Shared Medical Systems	19.25	-0.50	-2.53
OTC	24 88	13.50	Sungard Data Systems	23 00	0.25	1.10
NYS	6.13	1.13	Ultimate Corp.	1 75	0.00	0 00

KEY: (H) = New annual high reached in period (L) = New annual low reached in week

* Companies tracked in Computerworld Stock Index

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COMPUTER INDUSTRY

IN BRIEF

Lotus suit set for fall

■ U.S. District Court Judge Robert Keeton has set a Nov. 2 trial date for **Lotus Development Corp.**'s copyright infringement suit against **Borland International, Inc.** New motions for summary judgment were taken under advisement. Similar motions were denied in March.

■ U.S. technology firms reaped a record $400 million harvest of Japanese investment in 1991, according to a survey by market research firm **Technologic Partners.** That figure is up 60% from the 1990 total and up 33% from the previous all-time high of $300 million.

■ **IBM**'s low-end Application System/400s are now available via a toll-free number for Business Partners. The IBM On-Line program includes 90 days of free service with each new E02 or E04 model purchased and expands the number of resellers allowed to sell the boxes.

Short takes

■ **Cullinet Software, Inc.** founder John J. Cullinane has resigned his directorship at **Wang Laboratories, Inc.**, citing demands from other commitments. . . . **NBI, Inc.** President and Chief Executive Officer Stephen G. Jerritts will resign, effective June 19. NBI board member Ronald P. Erickson will fill in as chairman and interim CEO. . . . **Northern Telecom Ltd.** has joined the **Semiconductor Research Corp.** research consortium. . . . **Dayna Communications, Inc.** has appointed Brad Romney as president and CEO. . . . **Standard Microsystems Corp.** (SMC) announced early retirement of its $5 million Senior Subordinated Note payable to **Western Digital Corp.**, which canceled an attached warrant to purchase 500,000 shares of SMC common stock.

Everex rescues Northgate in buyout

Deal calls for stock swap between two clone makers; Northgate to still produce PCs under own name

BY CAROL HILDEBRAND
CW STAFF

Help came from unlikely quarters last week for troubled mail-order firm Northgate Computer Systems, Inc., which agreed to a merger via a stock swap with Everex Systems, Inc., a firm that has had some problems of its own.

Under the agreement reached last week, Everex will tender 750,000 shares, or about 3% of its common stock, in exchange for all the outstanding Northgate capital stock. Northgate will operate as an independent subsidiary and continue to produce personal computers under its own name for the mail-order channel only.

Northgate had previously acknowledged buyout/rescue talks with a number of different companies, but IBM was generally said to be the favored suitor. James Cannavino, general manager at IBM's Personal Systems Division, had termed such speculation as "way ahead of [its] time."

Cannavino acknowledged that IBM had talked to a number of direct-mail vendors — but only as a way of studying the low-end market. He said the company had reached the conclusion that IBM could manufacture PCs cheaper than any competitor.

Bought out

After three consecutive quarters in the red, Northgate finds itself purchased by Everex, which managed three consecutive profitable quarters

	Past five calendar quarters	
	Revenue*	Income*
	Everex	
Q1 '91	$109.5	$(1.5)
	$118.7	$(31.3)
	$131.2	$0.4
	$133.1	$1.2
Q1 '92	$140.0	$2.4
	Northgate	
Q1 '91	$46.9	$2.2
	$44.2	$1.9
	$37.0	$(0.44)
	$39.0	$(1.0)
Q1 '92	$34.3	$(1.5)

*In millions

CW Chart: Michael Siggins

The buyout comes at a good time for Eden Prairie, Minn.-based Northgate, which fell into financial difficulties after an ill-fated attempt in 1989 to add direct sales onto its mail-order base. The clone maker also suffered some hits in the vicious price war now raging across all sectors of the PC industry, analysts said. Northgate President Gary Held agreed that the buyout will help his firm out of a cash-flow jam.

The deal "allows us to get into a very lucrative market fast," said Hal Clark, president of Fremont, Calif.-based Everex. "We can't get into it without such an acquisition — it wouldn't be fair to our dealers."

Kimball Brown, an analyst at International Data Corp. in Moutain View, Calif., agreed: "They bought all this very cheaply. It doesn't really cost them anything, just dilutes the earnings a little." Everex "clearly wanted to pursue this channel and saw this as the best way to do it with a minimal impact" on its traditional network of dealers, he added.

Everex value-added resellers will continue to see Everex-only machines, Clark said, and there will be no mixing of the various distribution channels. What will be mixed is both firms' engineering and manufacturing, with Everex picking up the manufacturing of some of Northgate's line. Most of the engineering for all future Northgate products will also be done at Everex, Clark said. Clark did point to a few immediate changes, including the installation of a real-time order-entry and processing system.

Profit increase

Everex is bouncing back from some financial troubles of its own, analysts said. However, the firm reported its third profitable quarter in a row last week, announcing record revenue of $140 million, or a 27.9% increase over the comparable period a year ago.

Another area of concern was the PC maker's pinched credit situation, which also got a boost last week. Everex announced that its credit line has been increased $27.5 million to $72.5 million.

Analysts also pointed to the firm's increased presence in Europe and a wave of expansion into the mass merchandising and superstore channels as positive factors.

HP quarter ends with 40% jump in earnings

BY MARK HALPER
CW STAFF

Hewlett-Packard Co. continued to buck industry financial trends last week, reporting a 40% increase in net earnings for the quarter ended April 30 to $326 million, or $1.28 per share. That compares with net earnings of $233 million, or 93 cents per share, in the same quarter a year earlier.

Sales for the period rose 12%, to $4.18 billion from $3.73 billion. Earnings from operations before taxes totaled $486 million, up 32% from $367 million. HP registered $7 million in income from royalties, technical fees and other nonoperations.

In a prepared statement, HP Chief Executive Officer John Young attributed much of the company's $450 million in revenue growth to two product areas: peripherals and Unix-based minicomputers.

Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco, estimated that peripherals and Unix minicomputers each grew by $160 million to $180 million. HP's reduced instruction set computing-based Unix workstations also saw a modest increase in sales.

Although sales of HP's proprietary minicomputers declined, they managed to outsell their Unix siblings, clocking in at just over $2 billion compared with just under $2 billion on an annualized basis, Herwick said.

Analysts, however, said they expect the Unix boxes to overtake the proprietary models in revenue by year's end or soon thereafter.

Personal computer sales also took a hit, although Young said the business was profitable. Despite the surge in earnings, HP's stock dropped three points, from 77⅜ to 74⅜ last Monday, the day the company disclosed its results. Analysts attributed the decline to nervousness over a slump in the company's international performance.

CA boasts income, revenue growth in 1992

ISLANDIA, N.Y. — Computer Associates International, Inc. last week reported strong growth in revenue and income for its fourth quarter and fiscal year ended March 31.

For the quarter, revenue grew 31% to $469.86 million, compared with $359.83 million in revenue for the same period last year. Net income for the quarter was $57.74 million, a 48% leap over fourth-quarter 1991 net income of $39.09 million.

For the fiscal year, CA reported $1.51 billion, a 16% increase over $1.30 billion reported last year. Net income rose 25% for the year to $162.90 million, compared with $130.25 million in net income last year.

Charles B. Wang, chairman and chief executive officer of CA, was decidedly upbeat about the firm's results. "We are extremely pleased with the record results of the March quarter and the entire fiscal year as a whole — particularly in light of the continuing worldwide economic malaise," he said in a released statement.

Wang said the company has experienced strong growth in the sales of its microcomputer and midrange software products. CA does not break out sales figures.

WYSIWYG

From the "Things better left unautomated" department:

Software Grove Corp. in Kirkland, Wash., announces a software version of "While you were out" forms.

THE CEO TRACK

A recent Robert Half International survey revealed the type of background most suitable for becoming a CEO

Sales/Marketing	29%
Accounting/Finance	27%
Operations	22%
Generalist	8%
Legal	3%
Technical	3%
Public Relations	1%
Human Resources	1%
Other	6%

Base: 200 executives of the nation's 1,000 largest companies

SPRINT ANNOUNCES MOTHER'S DAY WEEKEND CALLING FOR MARS ARMED FORCES NETWORK

(Headline from a Sprint press release)

FROM OUR READER FILES:

"I was in programming class and the professor started talking about bits and bytes. One of the students looked at the keyboard in puzzlement and asked the professor where the bits and bytes were and what they looked like." (See BDU.)

I'm a little bit country, I'm a little bit IBM. . .

James Cannavino (left), general manager of IBM's Personal Systems Division, shuns the blue suit in favor of jeans, a bandana and cowboy hat to give country singer George Strait a few pointers.

EYE

SORE

New York's College of Optometry has established a Vision Therapy Unit to deal with computer-related eye problems. It treats a variety of ailments, including one in which users see images bathed in pink when they look away from a green computer screen.

Acronyms only the IS department knows:

BDU

Brain Dead User

Most inappropriate name for a portable, from Ergo Computing, Inc. in Peabody, Mass.

THE NOTEBRICK

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

WYSIWYG design and illustration: Tom Monahan

INSIDE LINES

A Big Blue clone. Not!

► Just how serious is IBM's love-hate affair with the clone market? Well, IBM has set June 4 as the date to announce its European clones, say sources familiar with the situation. But IBM won't make the statement. Instead, it'll announce the name of a new subsidiary that will then take over the event to announce the machines. IBM spokesmen were emphatic that this is *not* an IBM announcement. Sources say the sudsidiary, which will sell clone PCs without an IBM label, will operate independently of Big Blue. Really.

Apple gets organized

► Apple Computer will enter the consumer electronics market with a vengeance this Friday when it unveils a lightweight executive organizer that will include software that can read printed notes and then automatically add an appointment to a calendar, dial a phone or send a fax, said sources familiar with Apple's plans. The machine, which will reportedly be called the Intelligent Assistant, will network with other PCs via a built-in fax and data modem or a wireless infrared link that can send and receive data up to 6 ft. Intelligent Assistant — which will be sold for about $700 — will be built by Sharp and will be available in January, sources said.

Be my guest

► Microsoft's Windows New Technology 32-bit operating system will be able to host "guest" operating systems such as Unix — much in the way that IBM's VM hosts Unix or DOS/VSE. That's according to Dwayne Walker, Microsoft's director for Windows NT and networking products. Such a capability would help users who want to combine Unix systems with Windows NT's easy-to-use graphical user interface, he said. However, Walker added, "We're not out to position Windows NT as a replacement for Unix." Good thing.

Psst! Wanna buy a passive matrix?

► AST Research, Dell and Leading Edge have been falling all over themselves to cut prices on their passive-matrix color notebook computers — even to the point where the color notebooks can cost as little as $300 more than monochrome ones. "That category is going to go away," predicted Richard Zwetchkenbaum, an analyst at International Data Corp. "Most people would rather have active-matrix monochrome screens than passive color." According to analysts, the problem is the washed-out look of passive-matrix screens.

If you can't beat 'em . . .

► Apple software subsidiary Claris will unveil its first product for Microsoft's Windows platform on June 8, when it will also announce a version of its File-maker database that is functionally identical to the Macintosh edition. The package is scheduled to be available this fall.

A grapevine spreads at Prime

► The rumor mill again ground up Prime Computer last week as speculation continued about the minicomputer maker's financial prospects. Although company officials refused to comment, rumors are flying that Prime's profitable ComputerVision subsidiary will be spun off from the money-losing parent. Prime owner J. H. Whitney "has always said that it has viewed those as separate businesses," a Prime spokesman said. A just-released quarterly report from DR Holdings, Prime's main holding company, contains a new statement about considering "a variety of capital markets transactions" that could open the door for spinning off ComputerVision.

IBM's Jim Cannavino had just told reporters and analysts about the "terrible job" IBM and Microsoft did together on the early versions of OS/2 when a phone rang in the back of the room. The quick Cannavino jumped on this, stopping his shtick to say, "Somebody's shoe phone is ringing — could be Bill!" Keep our tip lines ringing by calling News Editor Alan Alper at (800) 343-6474, faxing him at (508) 875-8931 or CompuServing him at 76537,2413. Or, if you prefer to remain anonymous, check in with our 24-hour voice-mail tip line at (508) 820-8555.

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Nightmare Scenario #2

THE RUNAWAY CASH SUCKER.

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"What's with all this new payroll?" they ask. "I thought this thing was going to save us money."

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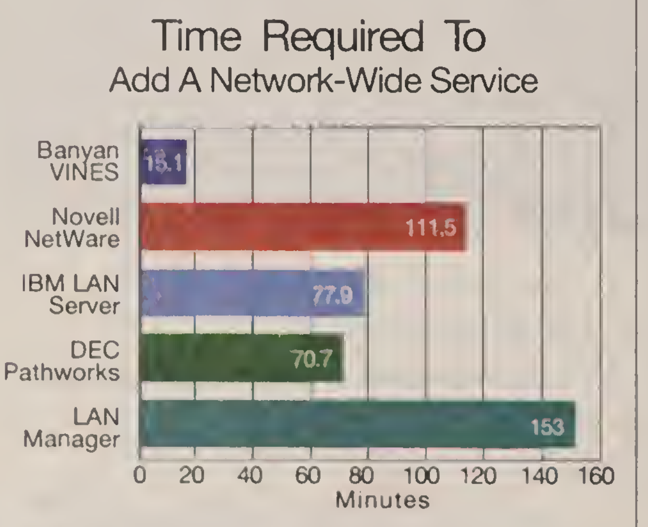
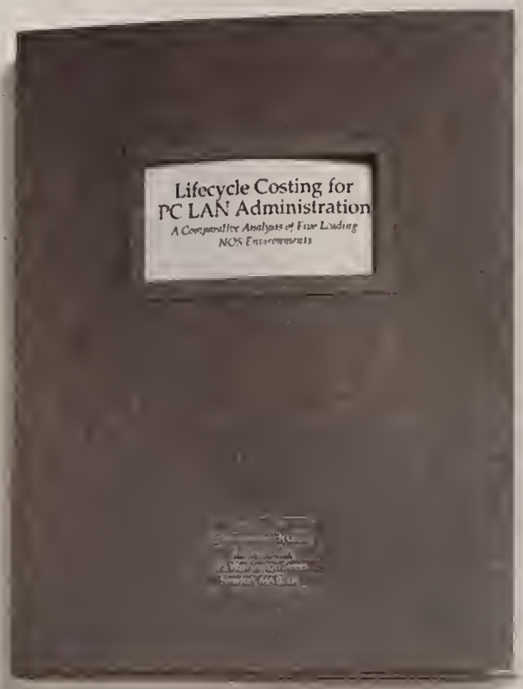
It was compiled by the Business Research Group, and shows how Banyan,® Novell,® IBM,® DEC,® and Microsoft® stack up against each other in cost of operation.

What BRG did was to interview the day-to-day LAN managers at 180 different organizations about the length of time required to execute 11 typical network functions.



Business Research Group/Newton, MA bc16D

For sheer cost-effectiveness, Banyan surpasses everyone.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